Journal
OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION

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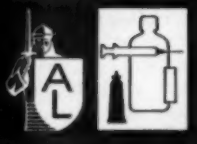

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Correspondence

December 23, 1957

To the Editors:

At the first meeting of the Educators in Veterinary Radiologic Science in Chicago in November of this year, the undersigned was directed as a committee of one to write to the JOURNAL in complaint about the quality of radiographic reproductions which are published.

There was general criticism of the quality of reproduction. From the points of criticism that were raised, and from my own experience in this line, I know that criticism took three channels. First, the quality of the paper on which the JOURNAL is printed is really poor for radiographic reproductions. It was noticed that the *Veterinary Record* uses high quality, high gloss paper inserts for this purpose. Second, many of the reproductions are too small to be of much value. Recently there has been some improvement on this score. Third, it is sometimes possible to improve reproductions by using better and more expensive half tones, or other reproduction methods.

Some members of the group were also critical of the selection of radiographs, indicating that some failed to prove the diagnosis.

Radiographs such as those published on pages 516 and 517 of the December 1 JOURNAL illustrate this point quite well.

Except for the fact that figure 2 of this manuscript does show a retrograde myelogram illustrating one of the author's points, the two photographs are quite meaningless. I am assuming that the original radiographs did show the points in question; therefore, the dismal appearance must be due to reproduction.

Those interested in radiology and also members of the AVMA are concerned not only with the waste of money and space taken by such meaningless reproductions, but also that these illustrations tend to discredit radiography.

Authors certainly should be urged to give greater attention to the quality of radiographic illustrations submitted, since it must be conceded that every step of reproduction produces some loss of detail. The editors should also be encouraged to refuse to publish radiographs that do not show sufficient contrast to warrant printing. Nevertheless, use of better quality paper and perhaps a little more money spent on the process of reproduction seems to me to be justifiable.

Very truly yours,
Gerry B. Schnelle, V.M.D.
Boston, Mass.

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AVMA Report

Developing Public Relations Awareness Among Veterinary Students

Mark Allam, dean, School of Veterinary Medicine, University of Pennsylvania

Presented at the AVMA Public Relations Conference, Cleveland, August 18, 1957

I should preface my remarks by saying that, while we are attempting to do a job at the University of Pennsylvania in developing public relations awareness in the veterinary medical students, we, by no stretch of the imagination, are doing a good job. We know what our goals should be but we are having difficulty in reaching them. We are probably doing the things that I will comment on. At least, we are exposing the students to these various ideas, but I am also equally confident that we are not practicing them day by day, as we should.

I realize there are many methods that could be employed in explaining a program for developing public relations awareness in veterinary medical students. Certainly, the veterinary medical profession, being comparatively young, requires our cooperative efforts to achieve the public respect due it.

Any successful public relations program for the veterinary profession, I believe, must begin within the veterinary school. It is certainly true that the efforts of the AVMA are of great importance in making the general public more aware of the contributions of our profession, and in emphasizing to the graduate veterinarian the need for good public relations.

However, it is during the four years that the future veterinarian spends in school that he or she is most receptive to the ideas and ideals of public relations. These are formative years when the individual is eager and willing to learn. The lessons taught at that time are those which will be carried more or less through life.

The students, as we all recognize, are to be our leaders of tomorrow, and we must look to them for the future progress of our profession. I believe there is a distinct relationship between the background of the veterinary student and his professional conduct when joining his community as a doctor of veterinary medicine.

I am very much concerned that the liberal education of each student be in proper balance with the instruction we give in the medical sciences.

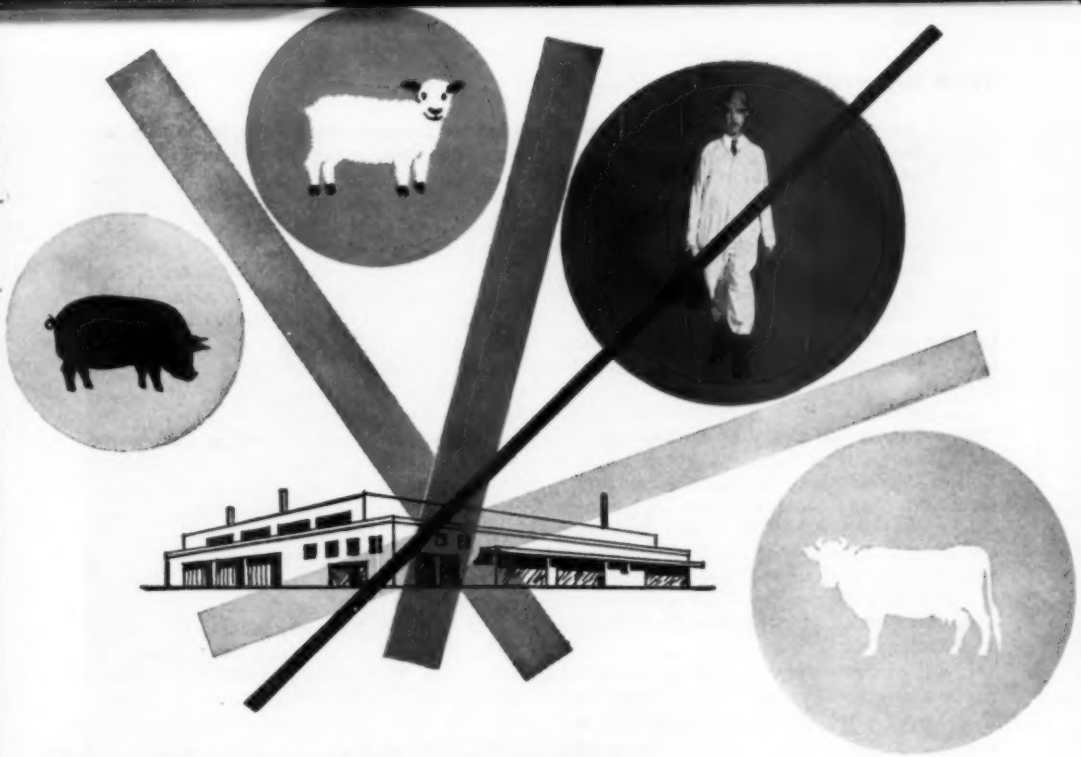
Public relations is not something tangible that can be purchased across the counter but, instead, is that which is developed in each of us by habit, experience and, more or less, is a primary result of instruction and direction.

Our responsibility as instructors in a professional school or college, then, is clear. The day-to-day conduct of our students is our public relations laboratory. Let us begin this instruction early—as a matter of fact, even before the student is formally in the professional school.

I should like to outline for you what I mean by "before we begin schooling". At Pennsylvania, prior to the formal opening of classes, we have the freshman orientation program week, with four days of instruction. It runs something like this: registration; the usual, sometimes very dry, welcome by the dean; showing of the motion picture, "Veterinary Medicine as a Career;" then a rather extensive tour of the campus, including some stops at the School of Medicine, School of Dentistry, University Hospital, and other points of interest.

The second day finds the students being instructed by the director of the Student Public Health Service, explaining the health program. Academic procedures and policies of the faculty are discussed by a member of the staff; the student honor system explained by another staff member, and also by the chairman of the student board of ethical relations. Student-faculty relationships is another topic discussed by a faculty member; the Student Chapter of the American Veterinary Medical Association is discussed, with the faculty adviser and president of the chapter doing the speaking on this subject. Also, the president of the Women's Auxiliary to the Student Chapter talks on the auxiliary program.

Fraternal organizations are not overlooked. The professional fraternities are represented. A question period follows. That completes the second day. No, it



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doesn't, because we do have the discussion by the librarian of the function and operation of the school's library.

The third day, we find a reception and tea sponsored by the faculty and alumni of the School of Veterinary Medicine, as well as of the School of Dentistry. We hold this jointly. Here we invite, of course, the incoming students and their wives, faculty, faculty wives, members of the alumni who are in close proximity and can attend, and their wives.

On Friday we have a full-day program, assembling at the school at Philadelphia in the morning, then boarding buses to New Bolton Center where we have a day of instruction and touring, and a popular chicken barbecue. To this affair, of course, are invited students as well as freshmen and seniors, and their wives, members of the staff and their wives. That gives you an idea of what happens prior to the starting of school.

I will not attempt here today to outline further any specific approach whereby we, in veterinary medical institutions, may develop a public relations awareness among our students.

However, two general factors seem to be of utmost importance in any program designed to accomplish this end: First, veterinary schools must make the student more aware of his responsibilities within the profession. This involves, primarily, his responsibility to conduct all of his future activities both as a student and as a graduate in an ethical manner. It also involves his future responsibilities to his school and to the various professional societies.

Secondly, the veterinary schools must imbue within the student a feeling of his responsibility to society and, particularly, to the community in which he will live. Every effort must be made to impress upon each student that his goal should not be what he can acquire but what he can contribute to the community in which he lives. A veterinarian is not necessarily an educated man if he can not appreciate his place and his responsibility as a man living among men. If he is culturally sterile and intellectually stagnant, he is not a doctor in the fullest meaning of the word.

The curriculums in the veterinary medical schools are already so crowded that it seems almost impossible to provide any new time which might be specifically utilized for formally discussing these two factors. The only course that I am aware of in our present curriculum, which in any way formally instructs in the area of public relations, is that of jurisprudence. This is defined by Webster as "the philosophy of positive law and its administration." This is fine for our legal responsibilities but how about our social obligations?

Hidden in this course, in some of our veterinary medical curriculums, is the instruction given on ethics and professional conduct. This is of value in preparing the student for his responsibilities within the profession. But I would like to see this area of instruction include a much broader discussion of the responsibilities of the veterinarian to his community life, including the need for his participation in service clubs, boards of public health, boards of education, and youth activities. This might be partially accomplished by having various community leaders participate in the course and discuss with the students the important part which they, as professional people, will be expected to play in their community.

Faculty members who have assumed positions of leadership in the community and within the profession should also be encouraged to participate in the course, and the need for students' future participation in the activities of local, state, and national societies should be emphasized.

In summary, the present time which is allotted in our curriculum for subjects related to public relations should be utilized for discussions of the subject on a much broader basis. The subjects should be presented early in the curriculum, not later than the first semester of the second year. This would allow the student to put the ideas set forth in the course into practice during his remaining years in school.

While formal instruction of this sort is needed in any program to develop an awareness of the need of public relations in, and among, our students, it is certainly not the complete answer to the problem. There are many other things during a student's life at the school which can contribute in a rather important way. The conduct of the student in the classroom is important and will, in a measure, reflect the type of behavior expected of him as a member of our profession.

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professional schools. I look upon this as a step in the right direction for, by such a program, we are helping to develop the moral integrity of each school.

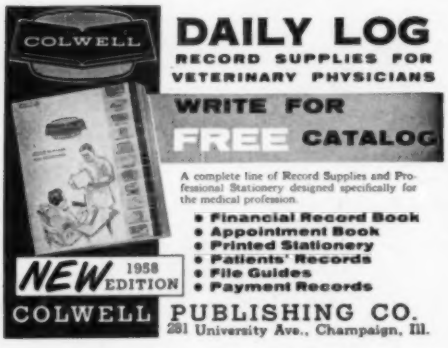
Dress which reflects neatness should be practiced by the student to offset what might be bad habits later on. In a measure, this has been an area somewhat difficult to cope with. Many seemingly logical excuses have been offered, but I do not believe that any excuse is really legitimate when, in principle, all one is asking is that the student appear neat and properly clothed.

Discipline is necessary if a successful program is to result. Students must recognize and respect authority. While I do not favor placing the professor on a pedestal far above the student, it is important that the student recognize that, if he is to learn, he must have respect for his teacher. This does not eliminate the opportunity for frank discussion nor even broad differences of opinion on certain subjects.

There are many opportunities for developing leadership in our veterinary medical schools: fraternities, year book publication, a student chapter of the AVMA, honor system, student councils, and many more. But we do need to develop more acutely the value of daily practice of our responsibilities, both as a teacher and student.

A veterinarian is an educated man when he appreciates his place and responsibilities as a man living among men. He is honest and has integrity above reproach and is a leader in community affairs.

This, ladies and gentlemen, I believe is public relations of real value to our profession, and it is our responsibility to see that it is so. Thank you.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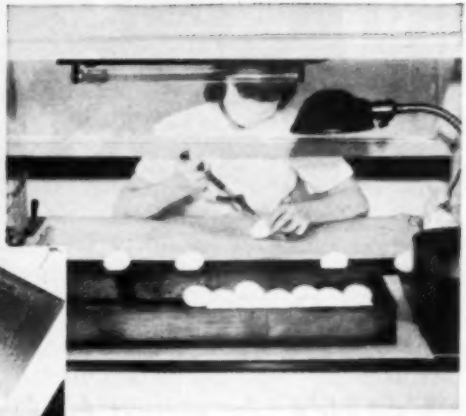

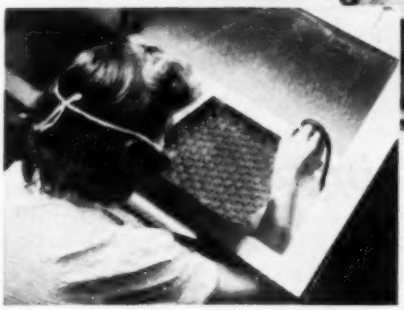

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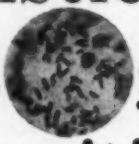

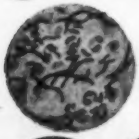

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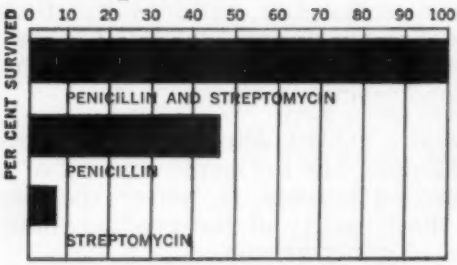

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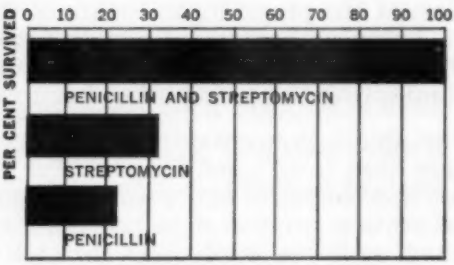

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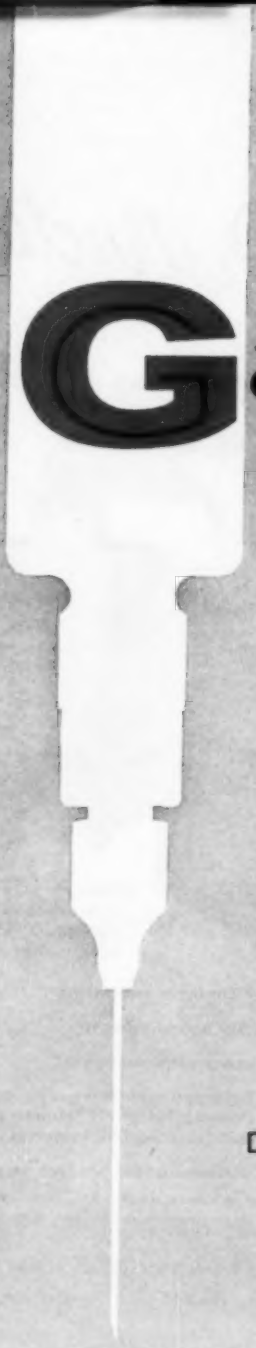

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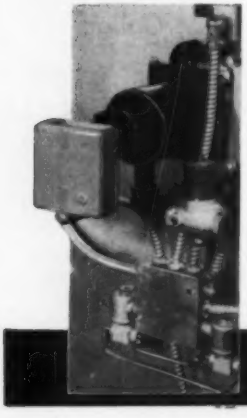

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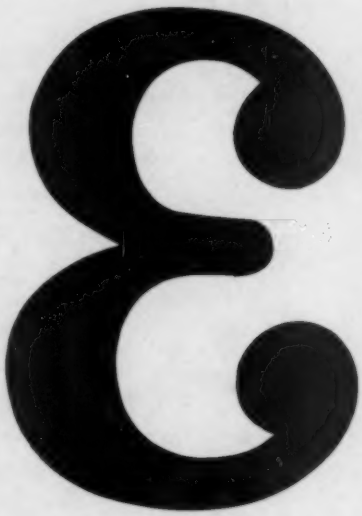

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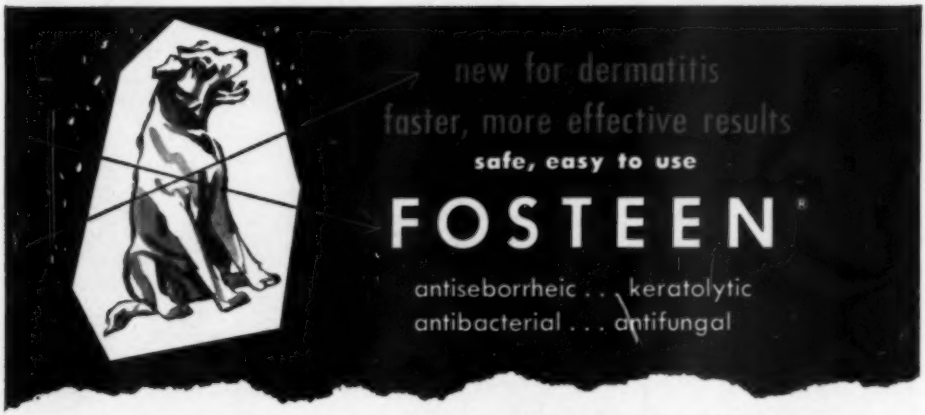

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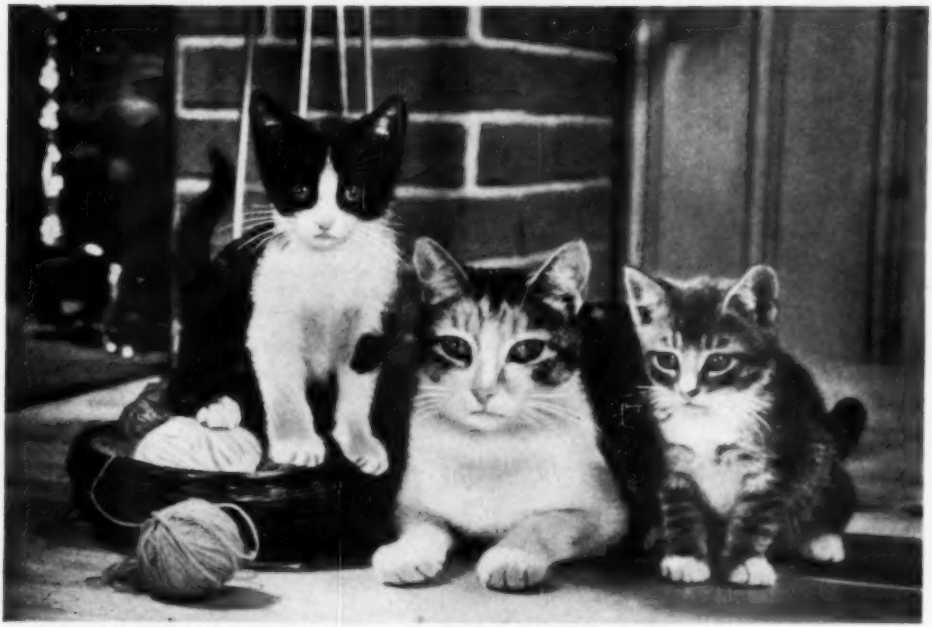

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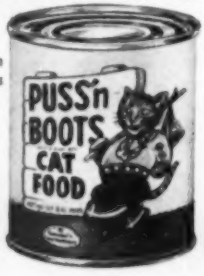

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REFERENCES: 1. Bull, W. S., N. Amer. Vet., in press. 2. Henry, R. T., and Blackburn, E. G., Vet. Med., in press.

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*Jones, S. V.; Belloff, G. B., and Roberts, H. D. B.: Vet. Med. 51:413 (Sept.) 1956.

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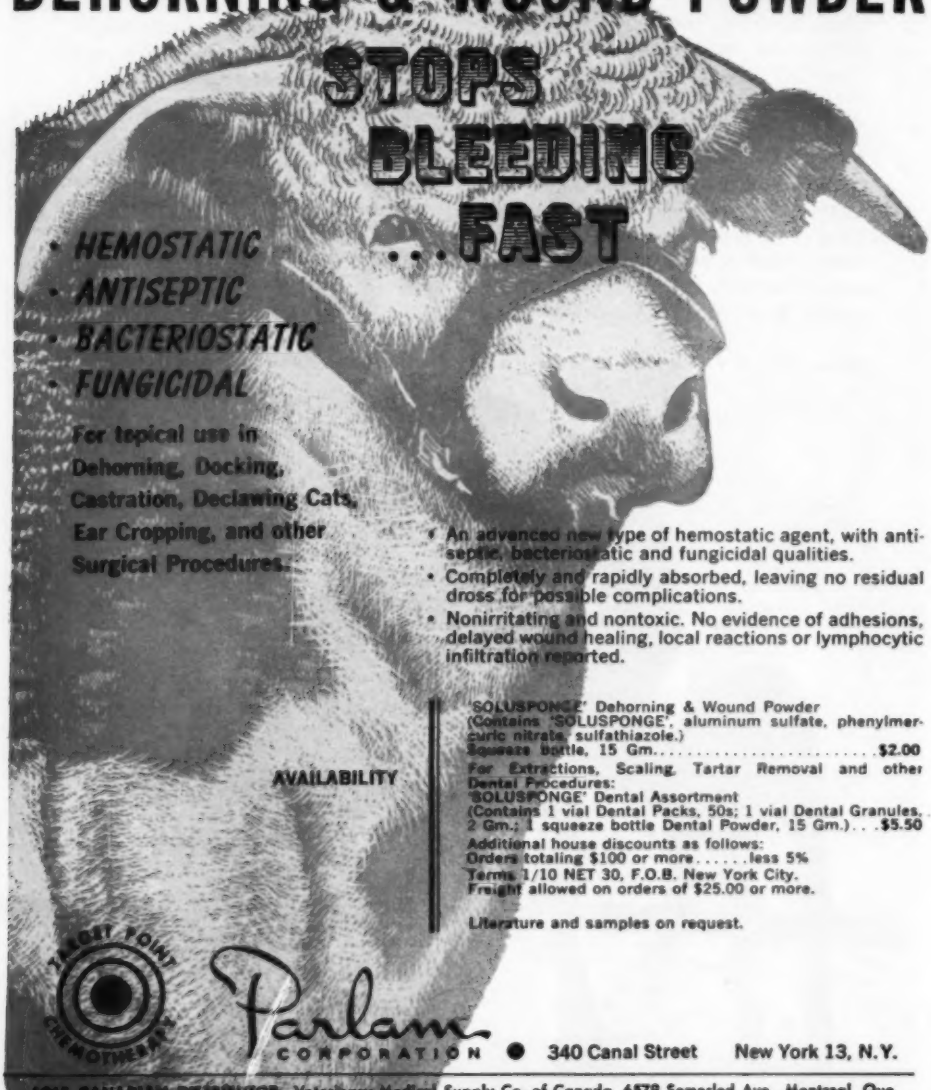

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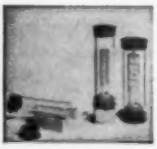

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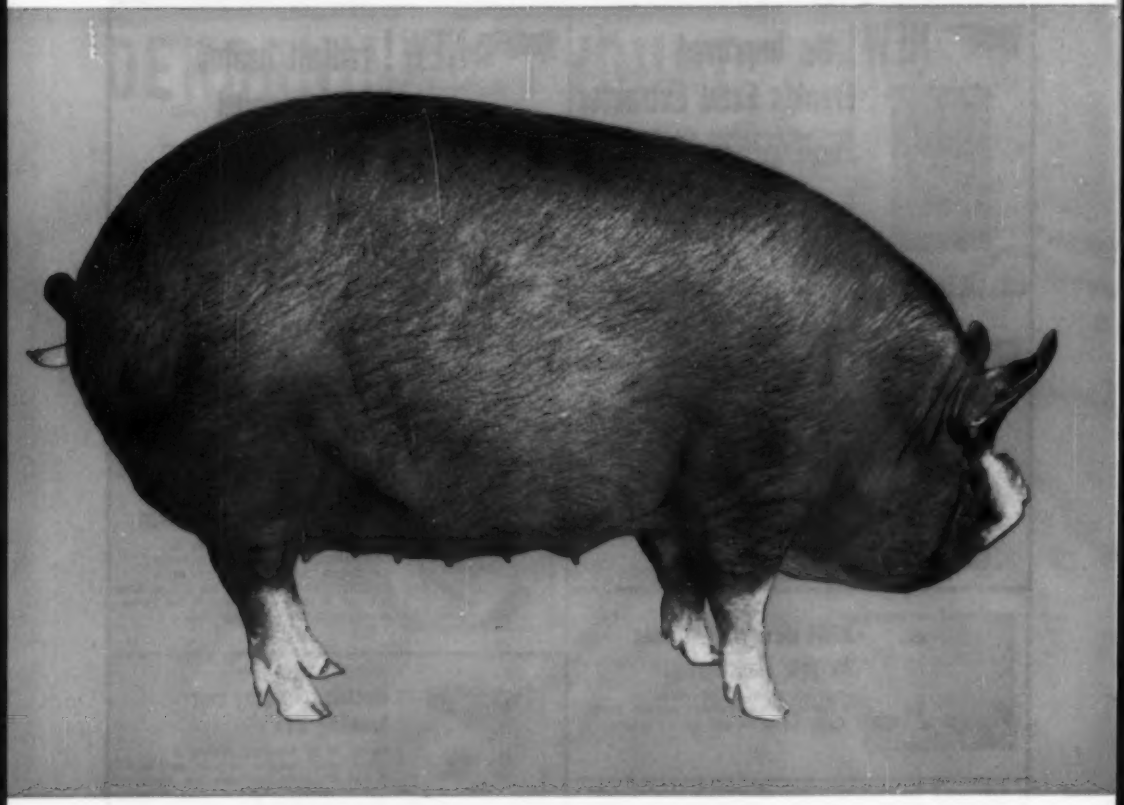

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A Comparison of Beagles Released for Private Ownership with Those Maintained Under Kennel Conditions

A. C. ANDERSEN, V.M.D., Ph.D.

Davis, California

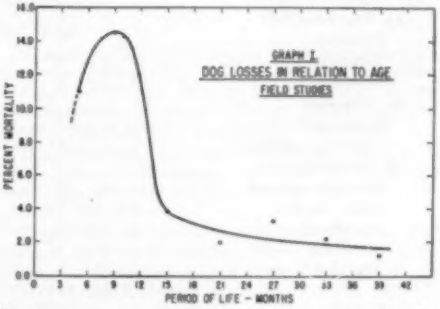
FROM 1952 to 1955, 220 purebred male Beagles were released from the Beagle Colony at the School of Veterinary Medicine, University of California, to persons residing in different areas of California. The purpose was to obtain information on the life span of these dogs in natural surroundings for comparison with the 523 which were maintained for experimental purposes. The dogs were assigned as follows: 36 per cent to large cities (100,000 or over), 40 per cent to small cities, 21 per cent to rural areas, and 3 per cent to mountain localities. Each owner agreed to keep us informed on the general well-being of his dog by replying to a questionnaire sent out annually in the form of a returnable postcard. During the past two years, 97 per cent have supplied the desired information. This report compares the ailments and mortality of these dogs with those maintained in our kennels.

The dogs released for this study were whelped and raised under conditions described in previous reports.[1,2] They were between 2 and 4 months old when assigned. In 1956, when many were approximately 2 years old, of the 220 dogs released, 146 were still with the owner, 49 were dead, 23 lost or stolen, and 2 had been returned to the kennel because of undesirable traits. Approximately 30 per cent of those accounted for were reported to have had the following ailments during a one-year period: infectious diseases, 10; eczema, 9; accidents, 5; diarrhea, 4; ear infections, 4; surgery, 3; fractures, 3; undiagnosed, 3; chronic illness, 2.

Over half (58%) of these ailments were treated by veterinarians. This list does not include vaccinations and other services by the veterinarian. If this is an indication of the number of dogs being treated in the United States today, some 5 million of the supposed 25 to 30 million dog population could be receiving veterinary services at least once yearly.

Of the 49 dogs reported dead, the following causes were given: motor vehicle accidents 27 (55%); disease 14 (29%); and miscellaneous 8 (16%).

The disease most commonly reported as the cause of death was distemper (9 of 14).



Graph 1—The percentage of dog mortality in relation to age.

Included among the eight miscellaneous deaths were electrocution by a broken power line, multiple bee stings, and drowning; 1 dog was reportedly beaten to death by a neighbor. As shown in graph 1, most of the deaths occurred when the dogs were

From the School of Veterinary Medicine, University of California, Davis.

Dr. Andersen is principal investigator, A.E.C. project No. 4, under contract AT (11-1) GEN 10, "The Effect of X-Radiation on Work Capacity and Longevity of the Dog."

TABLE I—A Comparison of Mortality and Disease Incidence in Beagles in Private Ownership and Those Maintained Under Kennel Conditions

	Field study	Kennel study
Total No. of dogs	220	523
Deaths	49 (22.3%)	69 (13.2%)
Ailments per year	43 (29.4%)	29 (6.4%)

approximately 9 months old. This can be attributed, at least in part, to the male dog's increased tendency to roam when approaching sexual maturity. One might speculate that by the age of 14 months the dog has learned to avoid motor vehicles and has obtained some degree of immunity against infectious diseases.

Unfortunately, 23 of the 220 dogs released were reported as lost or stolen. This suggests that the number of deaths reported is incomplete, since some of the lost dogs probably have died.

In contrast, the kennel records on 523 Beagles for the past five years show that 5 to 7 per cent of the dogs required veterinary attention in any one-year period. Lacerations or abrasions accounted for half of these ailments; the remainder were due to digestive disturbances, infectious and other diseases. Perhaps of more interest is the total number of deaths occurring in the colony during the five-year period. Sixty-nine (13.2%) of the 523 Beagles died; the causes may be divided into two categories:

1) Nonexperimental
   a) Reproduction
      Dystocia 8
      Toxemia 1
      Mastitis 1
   b) Diseases
      Distemper 14
      Chronic nephritis 2
   c) Miscellaneous
      Foreign objects 3
      Heat stroke 1
      Anesthesia 1
      Accident 1
      Bladder stone 1
      Total 34
2) Experimental
   Whole-body x-irradiation 35

Only about half the deaths were a direct result of experimentation. The ten caused by reproductive disorders, however, might also be considered in the experimental category, since the problems of reproduction constitute a major study of the project.

The comparison (table 1) reveals that the percentage of mortality was higher for dogs in private ownership. About half the deaths were due to injury by motor vehicles, while those in the kennel were largely a result of the experiment.

CONCLUSION

About 30 per cent of 220 male Beagles released for private ownership suffered some ailment during each year. Approximately half were treated by a veterinarian.

The highest mortality occurred among privately owned dogs, during the age of puberty. Motor vehicles accounted for over half the deaths in this age group (7 to 14 mo.). Under kennel conditions, the percentage of ailments and mortality was considerably less.

References

[1]Andersen, A. C., and Hart, G. H.: Kennel Construction and Management in Relation to Longevity Studies in the Dog. J.A.V.M.A., *126*, (May, 1955): 366-373.

[2]Andersen, A. C.: Puppy Production to the Weaning Age. J.A.V.M.A., *130*, (Feb. 15, 1957): 151-158.

The Span of Life of Pets.—Just as man's life span has increased, so it seems has that of the dogs and cats which live and eat with their masters. This may be partly due to prophylactic measures against viral infections which probably would have left some damaged organs and tissues although the animal appeared to recover. However, improved methods of feeding have doubtless played the principal role.—*Brit. Vet. J. (Nov., 1957)*: 445.

Testes Development in the Cat.—In the normal kitten, the testes were fully descended at birth and their combined weight increased from 20 to 100 mg. between birth and weaning. The earliest sign of spermatogenesis was at 20 weeks when the testes weighed 400 to 500 mg. The maximum weight of the two testes in the mature cat was 4 Gm.—*Vet. Bull. (Nov., 1957)*: 3420.

Phagocytin.—A study of how leukocytes fight bacterial invasions indicates that a substance named phagocytin, found in phagocytes, promptly kills intestinal bacteria; an acid environment and the protein, lysozyme, also kill bacteria.—*Sci. News Letter (Dec. 7, 1957)*: 356.

The Natural Occurrence of *Leptospira Pomona* in an Opossum—A Preliminary Report

E. E. ROTH, D.V.M., and B. B. KNIERIEM, B.S.

Baton Rouge, Louisiana

The purpose of this paper is to record the isolation and identification of *Leptospira pomona* from an opossum (*Didelphis virginiana*) trapped near Baton Rouge, La.

In Israel, *L. pomona* was isolated from a field rodent (Meriones sp.);[7] in Denmark, from a striped field mouse (*Apodemus agrarius*);[2] in Indonesia, from a dog;[4] in Italy, from a rat;[1] and in Portugal, from a mouse (*Mus musculus lusitanicus*).[3] In the United States, *Leptospira ballum* was isolated from an opossum.[8]

To the authors' knowledge, this is the first report of leptospirosis in an opossum, caused by *L. pomona*.

MATERIALS AND METHODS

Through the cooperation of the Forestry Department of the Louisiana State University, a number of wild animals have been made available for study. The trapped animals were anesthetized with pentobarbital sodium given intraperitoneally, and serum samples were obtained for serological studies. After exsanguination, the animals were submerged in a disinfectant solution of benzalkonium chloride for 30 minutes or longer. A necropsy was performed with special regard for aseptic technique. Urine from the bladder was obtained with a sterile syringe and 3 to 5 drops were inoculated into each of four tubes of Fletcher's medium. The inoculated mediums were examined by darkfield microscopy every seven to ten days. Serological examinations were performed using the macroscopic plate techniques.[6]

RESULTS

The wild animals trapped and studied consisted of 6 opossums (*Didelphis virginiana*), 3 beavers (*Castor canadensis carolinensis*), 3 nutria (*Myocastor coypu*), 2 armadillos (*Dasypus novemcinctus mexicanus*), 1 raccoon (*Procyon lotor*), and 1 rabbit (*Sylvilagus aquaticus aquaticus*).* Necropsy revealed no gross pathological changes that could be attributed to leptospirosis. A specimen of each kidney was preserved in 10 per cent formalin for future studies. There was no evidence of leptospirosis in these animals except in 1 of the 6 opossums. A Leptospira was isolated from the urine of this opossum. Two of the four tubes of Fletcher's medium which were inoculated with its urine were positive, one 45 and the other 62 days after inoculation. The remaining two tubes were discarded as negative 72 days after inoculation.

The Leptospira isolate was established and maintained in Fletcher's medium with difficulty. However, it was more readily adapted and maintained in modified semi-solid Stuart's medium prepared by the authors.[5]

A subculture of the organism was sent to the United States Public Health Service at Chamblee, Ga., where the isolate was identified as *L. pomona* by agglutination-absorption techniques.** The serum of this opossum was positive at a 1:40 dilution using the *L. pomona* antigen.[6]

More complete serological studies are in progress. This finding emphasizes the need for more investigations of leptospirosis in wild animals. It may account for the unexplained appearance of leptospirosis in domestic animals.

SUMMARY

Leptospira pomona was isolated from the urine of an opossum trapped near Baton Rouge, La.

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*The author thanks L. L. Glasgow, Forestry Department of Louisiana State University, for supplying the trapped animals.

**Grateful acknowledgement is made to Mildred Galton, U.S.P.H.S., Chamblee, Ga.

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A Comparison of the California and Whiteside Mastitis Tests

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The recently suggested California mastitis test adapts itself more readily to field conditions than the Whiteside test and because of this it should be preferable to the latter. However, it seemed desirable to compare results from the two tests. This comparison was carried out in conjunction with other mastitis studies.

METHODS

Quarter samples were obtained from 31 cows over a period of seven months and utilized in 2,000 comparisons. Samples were collected one to two hours after milking. The California test[3] was conducted within four to six hours after the samples were collected. The concentrated test solution* was diluted one part to nine parts alkaline tap water, according to directions. The test was made by using 2 to 3 ml. of fresh milk mixed with approximately 1 ml. of the working solution.

TABLE 1—Comparison of Whiteside and California Mastitis Tests Showing Agreement Figures at Junctions of Similar Ratings

Whiteside mastitis test	California mastitis test: ⊖	±	+	++	+++	++++
0	959	100	145	62	19	5
±	15	16	21	10	11	0
+	12	10	46	56	24	6
++	5	6	32	102	91	21
+++	0	1	2	24	84	50
++++	0	0	0	1	5	59

The Whiteside tests were run on the same samples after refrigeration for 24 hours in a manner similar to that outlined.[1] Five drops of the cold milk were placed on a glass plate and 1 drop of 1 N NaOH was added and the mixture stirred vigorously for about 20 seconds.

RESULTS

The data show (table 1) that approximately one half of the tests (959) were negative by both methods. There was agreement in 1,266 tests (63.3%) and disagreement in 734 (36.7%). If adjoining ratings (table 1) were considered comparable, then the agreement became 1,670 tests (approx. 80%) (table 2).

DISCUSSION

The disagreements were mainly in the first four columns (table 2) because the California test was somewhat more sensitive in the less intense reactions. Since most of the disagreements involved the more nearly normal samples, they were considered as being of limited practical significance.

TABLE 2—Agreement by Ratings of California to Whiteside Test when Adjoining Ratings Were Included in the Calculations

	⊖	±	+	++	+++	++++	Totals
Agreement	1,039	52	112	225	158	64	1,670
Disagreement	231	21	42	32	3	1	330
% Agreement	78.2	59.7	62.5	85.8	81.2	98.4	80.2

SUMMARY

The California and Whiteside mastitis tests were compared using 2,000 quarter milk samples. Agreement was obtained in 63.3 per cent of the samples, when comparison was based on identical ratings. When adjoining ratings were included in calculating agreement, the latter was approximately 80 per cent. The disagreements, percentagewise, were for the most part in the more normal samples.

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From the Department of Veterinary Science, Ohio Agricultural Experiment Station, Wooster, Ohio.

*Supplied by Dr. O. W. Schalm, Davis, Calif.

A Survey of Gastrointestinal Nematodes in Feeder Calves in Southern Illinois

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Robbs, Illinois

The role of gastrointestinal nematodes in cattle has received increasing attention recently, and several surveys have been carried out to determine their prevalence in different parts of the country. A survey of 135 cattle on 24 farms in east central Illinois[1] found averages of 58 strongyloid eggs per gram (e.p.g.) of feces in 65 adult dairy cattle, 43 e.p.g. in 45 adult beef cattle, 162 e.p.g. in 8 dairy yearlings, and 604 e.p.g. in 13 beef yearlings. It was concluded that adult cattle in that area do not, in general, suffer from serious parasitism.

In order to obtain information on this subject, a survey was made in southern Illinois in October, 1956.

METHODS

Fecal samples were collected, at a feeder calf consignment sale, from 362 calves, 6 to 12 months old, which had been raised on 131 farms in eight counties in southern Illinois. These represented approximately one fourth of the calves consigned to the sale from each farm.

TABLE I—Numbers of Strongyloid Eggs per Gram of Feces and Presence of Moniezia sp. Eggs in Native Feeder Calves in Southern Illinois

County	No. farms	No. calves	Mean No. eggs per gram feces*	Farms with Moniezia sp. (%)
Alexander	1	4	1,425	0
Hardin	22	62	760	41
Johnson	67	199	772	33
Massac	1	1	1,650	0
Pope	29	67	936	21
Saline	1	3	150	0
Union	5	16	1,078	20
Williamson	5	10	285	60
Total or mean	131	362	805	31

*Exclusive of Nematodirus.

Egg counts were made by the McMaster technique.[3] Two counts were made on each sample, and a dilution factor of 300 was used so that each egg seen represented 150 e.p.g. of feces.

It was not feasible, under the circumstances of this study, to make larval cultures and differentiate the strongyloid species present.

RESULTS

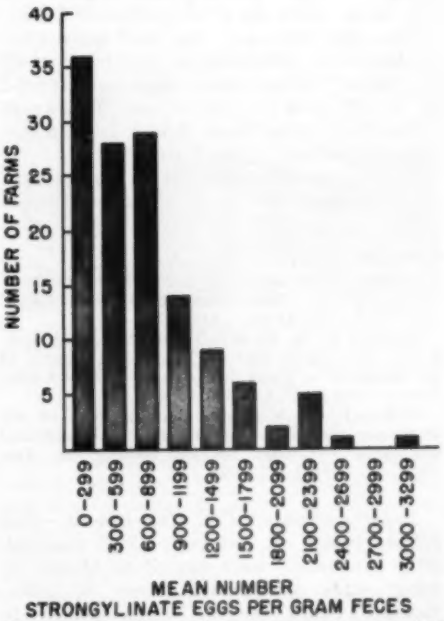
The average numbers of strongyloid e.p.g. of feces and the presence of Moniezia eggs are summarized by farms and counties (table 1).

Strongyloid nematodes are those belonging to the suborder Strongylina, which includes the genera Bunostomum, Chabertia, Cooperia, Haemonchus, Oesophagostomum, Ostertagia, Nematodirus, and Trichostrongylus. Since the eggs of all of these except Nematodirus are similar, they are grouped together.

Nematodirus was recorded separately and eggs were found in only 22 animals (6%). No attention was given to Strongyloides in this survey. The prevalence of strongyloid infection counts on the 131 farms is shown (graph 1).

DISCUSSION

The interpretation of fecal egg counts in cattle has been discussed by a number of workers.[1,2] It is recognized that, because



Graph 1—Prevalence of gastrointestinal strongyloid nematode infection in native feeder calves on 131 farms in southern Illinois.

From the College of Veterinary Medicine and Agricultural Experiment Station, Dixon Springs Experiment Station, University of Illinois, Robbs.

of their variability and because of a number of factors which can affect them, single fecal egg counts can give only a rough idea of the extent of infection in an animal or in a herd. Nevertheless, egg counts are of value particularly if, as in the present survey, several animals are examined in each herd.

A count of 300 mixed strongyloid e.p.g. of feces was considered the level suggestive of borderline or subclinical infection in cattle.[1] On this basis, the present survey demonstrates that a parasite problem exists in native feeder cattle in southern Illinois. Mean levels of 300 e.p.g. or higher were present among the calves on 72.5 per cent of the 131 farms studied. The level was 600 e.p.g. or higher on 51.0 per cent of the farms, 900 e.p.g. or higher on 29.0 per cent, 1,200 e.p.g. or higher on 18.0 per cent, 1,500 e.p.g. or higher on 11.0 per cent, and 2,400 e.p.g. or higher on 1.5 per cent.

SUMMARY

A survey of 362 native feeder calves, 6 to 12 months old, from 131 farms in southern Illinois, showed an average of 805 gastrointestinal strongyloid eggs per gram (e.p.g.) of feces. The average ranged from 0 to over 3,000 e.p.g. on different farms. It was over 300 e.p.g. (the level suggestive of subclinical infection) on 72.5 per cent of the farms. Nematodirus eggs were found in 6 per cent of the calves. Tapeworm (Moniezia) eggs were found in samples from 31 per cent of the farms.

Parasitism of native feeder calves may be a problem on many southern Illinois farms.

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Deterioration of Teat Cup Liners.—The rubber liners of teat cups (70% natural, 30% synthetic) were caused to blister by fatty acids, particularly those of intermediate chain length. When placed in melted, unsalted butter at room temperature, the rubber blistered in six hours. The liners deteriorated most rapidly when used on Jersey cows, and slightly more rapidly on Holstein-Friesians than on Guernseys. When used on udders that had been treated with ointments or injected with antibiotic preparations, the rate of blistering was not increased.

Blistering was delayed seven to ten days when the liners were stored between milkings in cold, 10 per cent lye solution. They deteriorated much more rapidly when the cows were on winter than when on summer rations or pasture. (The fatty acid composition of butterfat is higher in the winter.)—*J. Milk and Food Tech. (Nov., 1957)*: *312.*

Brucellosis Eradication Fund Threatened.—Just prior to 1953, federal aid to states for brucellosis eradication amounted to $4 million annually. In 1953, this was raised to $15 million by a diversion of funds from the Commodity Credit Corporation and, in 1954, it was increased to $20 million. As a result, eradication has been accelerated, with prospects of its practical completion by 1960. Now, Department of Agriculture officials have recommended that the diverted funds be discontinued, which would result in a 75 per cent reduction in funds for the eradication program.—*Hoard's Dairyman (Dec. 10, 1957)*: *1178.*

Stainless-Steel to Replace Cotton Plugs in Culture Tubes.—The discovery, in 1853, that filtering air through cotton removed airborne microorganisms, thus allowing ventilation of culture tubes without contamination, established bacteriology on a practical basis. However, cotton has many physical disadvantages. These can be eliminated by newly devised stainless-steel culture tubes and "closures" which allow an adequate exchange of gases. These can be used repeatedly.—*Science (Dec. 13, 1957)*: *1248.*

Dairy Statistics.—Of the consumer's dollar for fluid milk, 45 cents goes to the producer and 21 cents for milk plant wages. Half-gallon paper milk cartons cost about 3 cents each. Of the nation's total milk produced, 6.7 per cent is used in making ice cream.—*Hoard's Dairyman (Nov. 25, 1957)*: *1141.*

A New Type of Artificial Vagina and a New Collection Technique for Boar Semen

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Oslo, Norway

THE PRACTICAL USE of artificial insemination in swine has grown in popularity, in Norway, and the method is expected to become even more widely used. During the routine work of collecting boar semen for use in artificial insemination, we devised a new type of artificial vagina and a new collection technique; at the same time, bacteriological examination of the semen was carried out.

MATERIALS AND METHODS

A dummy sow for collection of boar semen has been described before[1] but, as the shape is important in connection with the use of the new type of vagina and the new technique, the more important details will be mentioned.

To insure a convenient working position for the operator, it is important that the hindlegs of the dummy are placed relatively well forward. During the collection of semen, the dummy may easily be soiled with secretion from the prepuce, and bacteria can be transmitted from one boar to another. Therefore, washable covers are used and changed after each collection. The block on the front part of the dummy prevents the boar from getting too far forward during the collection of semen (fig. 1).

ARTIFICIAL VAGINA

For collection of semen in boars, an ordinary artificial vagina, as designed for a bull, was used,[1] the semen container being somewhat larger and, in some instances, a pulsation pump for use during collection was added.[3,5]

We designed a new type of artificial vagina (fig. 2, 3); it is about 18 cm. long and has the same diameter as the model used for a bull. It contains two inner tubes, one for air and one for water, since the valve of the air pump becomes clogged if water and air are in the same compartment. Experience has shown that the boar prefers smooth inner tubes.

An inner tube, with the rough surface turned in, is used as a funnel. The semen is collected in a 500-ml. plastic bottle which has a double lid perforated with 2-mm. holes. The gelatinous part of the semen is retained as the rest passes through the lids and no further filtration of the semen is necessary. The vagina is warmed with 300 ml. of water at 50 C. and is then lubricated and air is pumped in. The pump has a valve to permit release of air in case the pressure is too high.

The foam rubber piece with its star-shaped hole is fastened over the end of the vagina which is attached to a metal splint by means of an elastic band. The plastic bottle is supported in the same way at the other end of the splint.

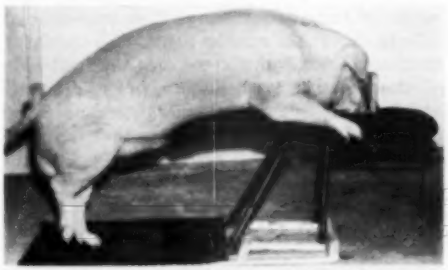


Fig. 1—Photograph showing the adjustable wooden block on the foremost part of the dummy sow; it prevents the boar from getting too far forward during collection of semen.

When the vagina is ready for use (fig. 3 c), a hole in the funnel, laterally, near the vagina, permits escape of prepucial secretion during semen collection, and thus prevents it mixing with the semen. Also, the splint is bent to prevent flow from the vagina into the bottle.

The foam rubber piece is designed to give the penis a mechanical cleansing when passing through it, and also—like the hole in the funnel—to prevent, in some measure,

From the Institute of Sexual Physiology and Sexual Pathology and from the Hygienic-Bacteriological Department, Veterinary College of Norway, Oslo.

This investigation was financed by the Agricultural Research Council of Norway.

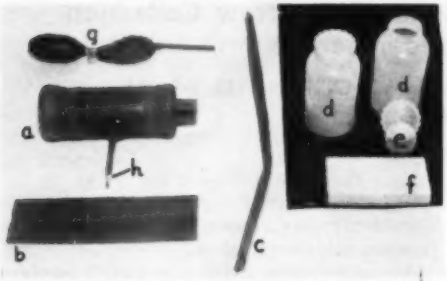


Fig. 2—The new type of artificial vagina for a boar, disassembled. The vagina (a) is 18 cm. long and has the same diameter as the model used for a bull. The inner tubes, 28 cm. long, are used as a funnel (b). There is a metal supporting splint (c), 46 cm. long and 5 cm. wide. The 500-ml. plastic bottles (d) have a double plastic lid (e) perforated with 2-mm. holes. The foam rubber piece (f) is 2 cm. thick, 7 cm. wide, and 14 cm. long and has a star-shaped hole (0.8 cm. in each direction) for the penis. The air pump (g) is attached to the tube (h) on the vagina.

the flow of prepuce secretion into the vagina and the semen bottle. Except for the foam rubber piece, which is used only once, the entire apparatus can be boiled and used several times.

Collecting of Boar Semen

When the boar mounts the dummy, the penis is threaded through the star-shaped hole in the foam rubber piece. The operator then sits down on a stool on the right side of the dummy, with the vagina in the left hand and with the right hand grasping the funnel (fig. 4). The operator then tries to catch and hold the penis with the right hand. As a rule, the boar will move the penis forward and backward several times before it is possible to get a firm hold on it.

Fig. 4—Photograph of the vagina and bottle. The operator has caught the tip of the penis in his right hand and the bottle has been detached from the splint (x).

Fig. 3—The new artificial vagina, assembled. Notice the foam rubber piece (f) covering the entrance, the hole (arrow) in the funnel near its fastening to the vagina, and the supporting splint (c) holding the bottle (d).

As soon as the penis is fixed in the hand (fig. 5), ejaculation begins and an assistant detaches the plastic bottle from the supporting splint so that the semen can flow directly into it (fig. 6).

During the attempts to catch the penis, the vagina must always be held in such a way that prepuce secretion will not flow down into the bottle. Usually, some of the secretion which might have passed the foam rubber piece will flow out through the hole in the funnel.

The Ejaculation

It has been presumed that the main function of the mucous fraction of boar semen was to seal the cervix of the sow after coitus.[2,3,5] By using a transparent funnel (fig. 7), it was observed that part of the mucous fraction which comes before the sperm-rich part of the ejaculum also has the function to prevent backflow of semen during coitus.

The left-hand spirally-twisted extremity of the penis, during ejaculation, always turns the tip dorsally and the first spiral settles along the right side of the funnel. The craniocaudal slitlike urethral orifice is directed dorsally on the tip of the penis. At the beginning of the ejaculation, the semen consists of a sticky, strongly coherent, mucous substance which forms a wreath-shaped mass around the tip of the penis (fig. 8). The mucous substance rolls onto the left side and fills the space between the inner curve of the first spiral and the left funnel wall (fig. 9). The wreath-shaped mucous mass evidently is meant to pack closely around the tip of the penis to permit the semen to be forced directly into the uterus of the sow during coitus. The effect of this mucous mass may be compared with that of the inflatable cuff on the insemination tube previously described.[1] After the mass has been formed,

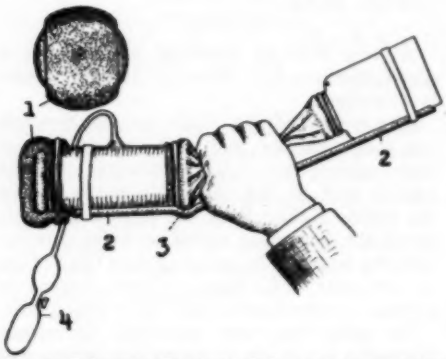


Fig. 5—Schematic drawings of the operator grasping the penis. Notice the opening in the center of the foam rubber piece (1), the bent splint (2), hole in the funnel (3), and air pump (4).

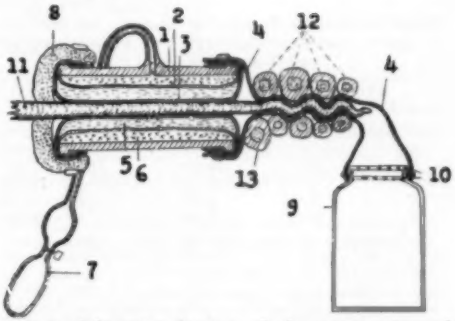


Fig. 6—Schematic drawing of the cross-section of the vagina during ejaculation; the outer wall of the vagina (1), inner air tube (2), inner water tube (3), funnel (4), water (5), air (6), air pump (7), foam rubber piece (8), plastic bottle (9), double, perforated lid (10), penis of boar (11), cross-section of fingers of right hand (12), cross-section of thumb (13).

the sperm-rich part of the semen is ejected cranially with great force.

THE NUMBER OF BACTERIA IN BOAR SEMEN

The microflora in boar semen collected with an artificial vagina has previously been investigated.[6]

While experimenting with the new type of artificial vagina and the new technique, semen specimens were collected systematically, for bacteriological examination, from boars used in artificial insemination. The method used in bacteriological examinations and differentiation of the species of bacteria found will be dealt with in detail in a special article.[4]

The total number of bacteria was high in boar semen collected with an artificial vagina of the ordinary type, the average being about 158,000 bacteria per milliliter. It was believed that the great number of bacteria came from the prepuce. To investigate this, the bottle was separated from the vagina and the funnel was split to make it possible to collect specimens of

TABLE 1—Number of Bacteria Per Milliliter of Semen Collected at Intervals During Ejaculation

Boar	Specimen					Av.
(No.)	1	2	3	4	5	No.
10	2	9	2	11	9	6.6
4	15	10	15	15	65	24.0

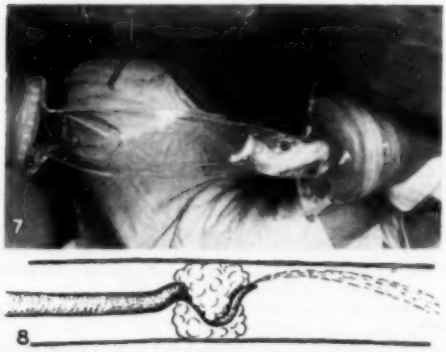


Fig. 7—Photograph showing the spiral portion of the penis in the transparent funnel.

Fig. 8—Schematic drawing of the tip of the penis during ejaculation. The left hand spirally curved tip of the penis is directed dorsally. The wreath-shaped mucous mass is forced to the left and fills the space between the penis and the left wall. The sperm-rich part of the semen is then ejected cranially (right side view).

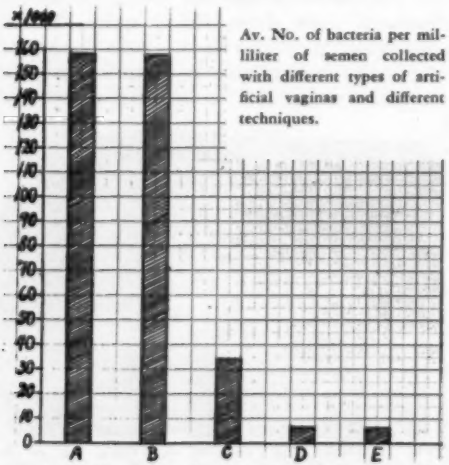
Fig. 9—Photograph showing the spiral tip of the penis along the right wall and the mucous mass on the left side.

TABLE 2—Average Number of Bacteria Per Milliliter in Semen Specimens Collected with Different Equipment and Techniques

Method	No. of collections examined	Av. No. of bacteria/ml.	Range
A	21	158,300	38,200-281,500
B	55	158,100	21,200-282,900
C	41	34,300	5,700- 58,400
D	31	6,800	600- 9,000
E	32	6,300	800- 10,400

A) Collection of semen with an ordinary artificial vagina as used for a bull. (B) Collection of semen with a short artificial vagina (bull) and fixation of the penis in a funnel. (C) Collection of semen with the new type artificial vagina with supporting splint, hole in funnel, and fixation of penis. (D) Collection of semen with the new type of artificial vagina with supporting splint, hole in funnel, fixation of penis, and vagina entrance covered with foam rubber piece. (E) Collection of semen with new type of artificial vagina with supporting splint, hole in funnel, fixation of penis, and vagina entrance covered with foam rubber piece which has been moistened with an antiseptic. Statistically, there is a reliable significance between groups B and C, C and D.

the semen for bacteriological examination directly from the semen as it left the penis. Five specimens of semen were collected from a single ejaculation from boars 10 and 4 (table 1). The average number of bacteria in semen from boar 10 was 6.6 per milliliter, and in semen from boar 4 was 24.0 per milliliter. The number of bacteria in the semen was minimal and, consequently, the high number of bacteria in semen collected in the usual way must come from the prepuce. The reduction of the number of bacteria in the semen, when using the new type of vagina and the new technique, is summarized (table 2) and graphically represented (graph 1).



Graph 1—Showing reduction of bacteria when the new type of vagina was used (see also table 2).

SUMMARY

A new type of artificial vagina and a new technique for collection of boar semen is described.

The penis of the boar passes through the short vagina and into the funnel. A bent supporting splint, attached to the vagina and to the collecting bottle, keeps the bottle higher than the vagina and prevents the prepucial secretion from flowing into the bottle. The opening into the vagina is covered with foam rubber having a central, star-shaped hole for the penis.

In using the new collecting technique, the penis is caught through the funnel and fixed with the right hand. When ejaculation has started, the bottle is detached from the supporting splint while the tip of the penis is still held higher than the vagina. The semen flows directly from the tip of the penis through the perforated bottle cap, which filters the mucus into the bottle. Any secretion from the prepuce which might have passed the foam rubber piece remains in the vagina and flows out partly through the hole in the funnel. Fixing the penis in this way corresponds to natural copulation, where the penis twists into the cervical canal of the sow.

When using the new artificial vagina and technique, the number of bacteria in semen was reduced by 96 per cent, as compared with the use of an ordinary artificial vagina as used for a bull.

It was shown that during ejaculation, in boars, a wreath-shaped mass of mucus is formed around the tip of the penis before the ejaculation of the sperm-rich part of the semen starts, probably to prevent the semen from flowing back into the vagina of the sow during the coitus.

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Trimar Anesthesia for Cats

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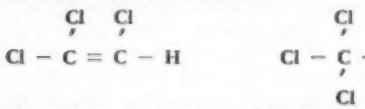
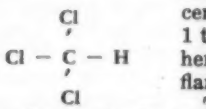
Madison, Wisconsin

THIS IS A REPORT on administering trichloroethylene, an anesthetic agent, to more than 300 cats in preparation for surgery. An inhaler especially designed for cats was used (fig. 1).

Trichloroethylene is a colorless, volatile liquid and resembles chloroform in odor as well as in chemical formula:



trichloroethylene molecule



chloroform molecule

Its specific gravity is 1.47, vapor density 4.53, boiling point 80 C. To be U. S. P.-approved, purified trichloroethylene is stabilized by the addition of 0.01 per cent thymol, and a certified dye is added for identification purposes. Commercial trichloroethylene contains toxic impurities and should not be used for anesthetic purposes. Trimar,* a purified trichloroethylene, was used.

Under normal clinical conditions and in air at temperatures below 32 C., trichloroethylene is nonflammable. At temperatures above 32 C., the minimum flammability concentration is 15 per cent. Concentrations of 1 to 2 per cent are delivered by the inhaler; hence, there should be little concern over flammability.[4]

The low volatility of this agent makes it unsuitable for use in the open-drop technique, so the special inhaler is necessary. With the inhaler, it is possible to control the depth of anesthesia or to eliminate the agent completely. Induction of this anesthesia is usually smooth, probably due to a lack of pungent odor. The liver function

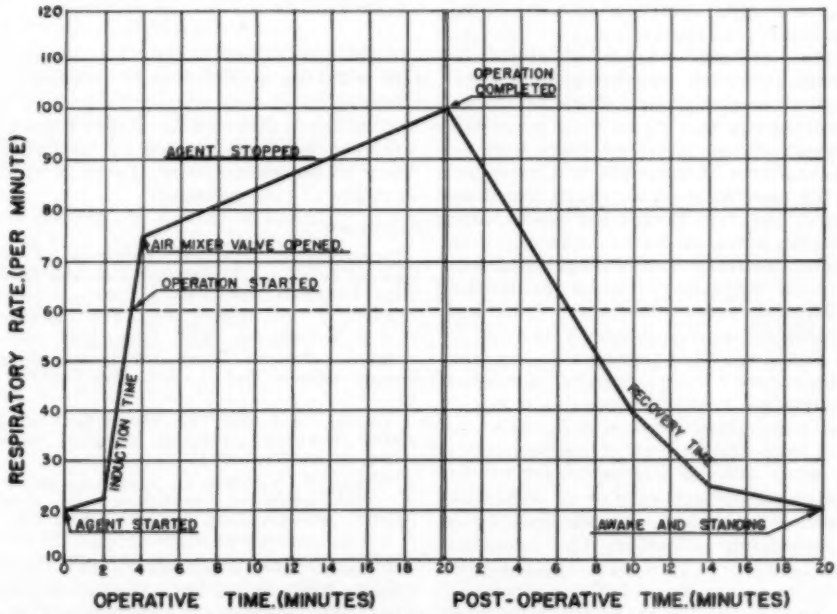


Chart 1—Respiratory rate and induction time during surgery on a cat. The cat was spayed and declawed.

Dr. Candlin is a small animal practitioner in Madison, Wis.

*Trimar, product of the Ohio Chemical and Surgical Equipment Co., Madison, Wis.

is reported to be less noticeably disturbed than when ether or chloroform are used,[1] and changes in blood and urea values appear to be negligible. Capillary oozing from cut surfaces appears to be materially reduced,[3] and renal function is not altered to any significant degree.[2]

Fig. 1—Photograph showing the method of restraint and application of the special inhaler while anesthetizing the cat with purified trichloroethylene.

Cardiac arrhythmias and resultant fibrillation have been reported with an overdose of trichloroethylene.[5] However, cardiac arrhythmia was noticed in only a small percentage of our cases and there were no cardiac failures attributable to this agent.

At the onset of anesthesia, apnea will occasionally occur in the cat, but several manual compressions of the thoracic cage will institute breathing and almost immediate anesthesia. Adjusting the inhaler to full concentration reduces induction time and minimizes the bite and scratch hazard. In more docile patients, trichloroethylene can be administered with gradually increasing concentrations without noticeable apnea.

The respiratory rate will usually increase from the normal of approximately 20 to 80 or 100 per minute (chart 1). An excessive respiratory rate is an indication of overdose and a sign that the opening of the air-mixing valve on the vaporizer should be slightly increased. Anesthesia is usually maintained as light as possible with the maximum mixture of air. If more relaxation is required, it may be obtained by the use of muscle relaxants.

At the onset of anesthesia, analgesia is produced. Under it, many operations such as declawing, suturing, and castration can be performed. Surgical anesthesia is produced in three to five minutes. No premedication was given to any of these cats. In some patients, a slight amount of salivation was noticed.

For restraint, the routine procedure is to tape the cat's front paws and fix the hindlegs in sling straps attached to the operating table (fig. 1). The cat is then grasped around the thorax with one hand, with the forelegs between the index and middle finger and the sling straps tight; the mask is applied with the other hand. It is usually advisable to have an assistant when restraining large cats, particularly old males. Recovery from the anesthesia is rapid and animals routinely spayed can be sent home within an hour. Because of rapid recovery and self-care, there appears to be less incidence of postsurgical complications. There were no untoward effects.

As the animal emerges from anesthesia, it will usually exhibit chewing movements for several minutes. Care should be exercised in handling the animal during this period. Recovery from anesthesia will be complete in 15 to 20 minutes.

SUMMARY

Trichloroethylene (Trimar), given to cats with the special inhaler, provided an efficient, safe, and simple method of inducing anesthesia in cats. Rapid induction and recovery and greater control of the depth of anesthesia were the primary advantages of this procedure.

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Progesterone-Induced Estrus in Castrated Cows.—Seven cows, 2 to 4 years old, were bilaterally ovariectomized, at Iowa State College, then later estrogen-conditioned and injected subcutaneously with 1 mg. of progesterone. In 31 trials, reception of the male occurred in 18 cows, and no signs of estrus in only 5. Estrus appeared usually in 18 to 39 hours and lasted six to nine hours. Cows given large doses of progesterone (30 mg.) failed to show signs of estrus.—*J. Anim. Sci. (Nov., 1957): 967.*

Passive Immunity to Hog Cholera in Nursing Pigs

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THE DURATION and degree of antibody transfer from hog cholera-vaccinated dams to nursing pigs has not been fully determined. Varied susceptibility to hog cholera in pigs which are nursing immune sows has been observed by veterinarians in the field.

It has been reported[4] that milk from immune sows appeared to have some influence in maintaining resistance in suckling pigs. Also,[2] a high percentage of pigs nursing sows immunized by the serum-virulent virus method were immune when challenged as late as two weeks after weaning, and pigs in the second litters were all protected. There seemed to be little difference in susceptibility of the suckling pigs to different methods of exposure.

The route of antibody transfer from sows to pigs was found to be through the colostrum.[1] These findings were confirmed[3] and it was shown that pigs nursing immune sows did not react to the virus, while their hand-fed litter mates were susceptible.

The present work was conducted to provide additional information on the duration and degree of passive immunity in pigs nursing hog cholera-vaccinated gilts, using two different types of vaccines. The increase in passive immunity obtained in the pigs by revaccination of their dams was also studied.

MATERIALS AND METHODS

Five female litter mates from an unvaccinated sow were used. At 6 weeks of age, gilts 2, 3, and 5 were immunized against hog cholera with 2 ml. of a modified virus vaccine (Rovac*) and were penned together. Gilt 4 was given anti-hog cholera serum and virulent virus and placed in isolation. Gilt 1, the unvaccinated control, was also kept in isolation. All 5 gilts were bred to farrow at 1 year of age.

After 90 days of gestation, gilts 3 and 5 were revaccinated with 2 ml. of the vaccine and placed in isolation, and gilt 5, at two weeks postpartum, was given a third dose of the vaccine.

Before and after the initial 24-hour nursing period, a blood sample was taken from 1 identified pig in each litter for electrophoretic determination of *gamma* globulin.

As they reached 4, 6, 8, and 10 weeks of age, 2 pigs from each litter were removed and challenged with 2 ml. of virulent virus intramuscularly. The reactions observed were: (*a*) evidence of leukopenia, (*b*) temperature increase, (*c*) suppression of appetite, and (*d*) survival time.

Daily rectal temperatures and feed consumption were recorded for each animal from the time of challenge until the end of the experiment. Leukocyte counts were made on all pigs before challenge and on the fifth and tenth day after challenge. Weekly records were kept on all pigs. The pigs which died were necropsied.

TABLE I—Duration of Passive Immunity to Hog Cholera

Dam No.	Immunization of dam (age and type)	No. in litter	No. of pigs challenged—by ages and survival			
			4 weeks	6 weeks	4 weeks	6 weeks
1	Control—not vaccinated	8	0/2**	0/2	0/2	0/2
2	Vaccine (2 ml.) at 6 weeks of age	8	0/2	0/2	0/2	0/2
3	Vaccine (2 ml.) at 6 weeks of age and when 90 days pregnant	8	2/2	2/2	1/2	0/2
4	Antiserum and virulent virus at 6 weeks of age	9*	1/1	1/1	0/1	—

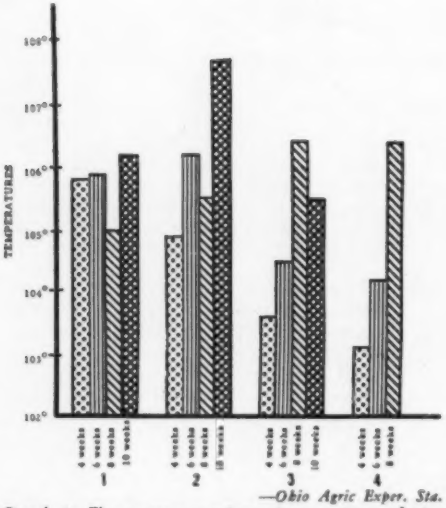
*Farrowed 9 pigs, 6 died within two weeks with acute dermatitis; **surviving ratio.

RESULTS

The results of challenge are shown with regard to survival (table 1), length of survival (table 2), and temperature changes (graph 1). The pigs from gilt 4 (serum and virus immunized) were better able to withstand the challenge of 2 ml. of virulent virus than the pigs of gilt 2 (one dose of vaccine). Gilt 3 (revaccinated) was able to confer a passive immunity to her pigs which was comparable to that in the

From the Department of Veterinary Science, Ohio Agricultural Experiment Station, Wooster.

*Rovac is produced by Lederle Laboratories, Pearl River, N.Y.



—Ohio Agric Exper. Sta.

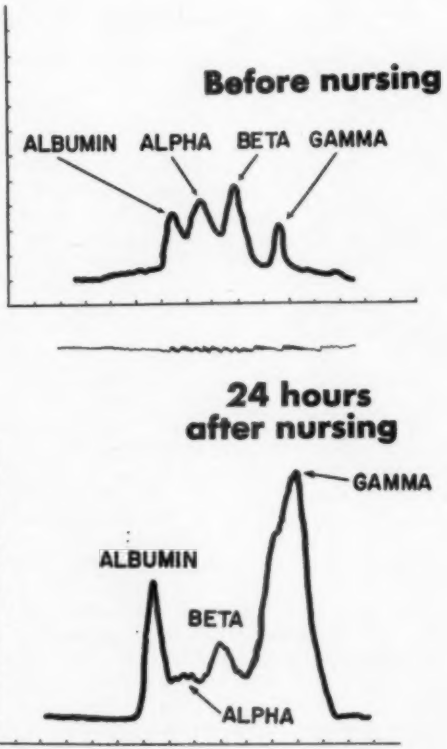
Graph 1—The average maximum temperatures of pigs taken for three consecutive days after challenge are shown by gilt numbers and by challenge periods.

limited number of pigs of the serum-and-virus-immunized gilt 4.

The pigs in the control litter all showed typical clinical signs and lesions of hog cholera.

The 2 pigs from gilt 2 which were challenged at 4 weeks of age were dead within 13 days. However, their appetites and leukocyte counts remained normal longer and they survived longer than did the control pigs challenged at the same age. Other pigs from gilt 2, when challenged later, gave no evidence of protective antibodies.

The pigs of gilt 3, which were given virulent virus at 4 and 6 weeks of age, remained normal and gained weight steadily throughout a three-week postchallenge period. However, the 2 pigs which were challenged at 8 weeks of age both showed a febrile response and inappetence; 1 showed a slight leukopenia on the tenth day and



—Ohio Agric Exper. Sta.

Graph 2—Comparison of plasma proteins in the blood serum of a pig before and after nursing a hog cholera-immunized dam (No. 3).

died of hog cholera on the sixteenth day; the other pig showed no leukopenia and survived. The 2 pigs challenged at the tenth week showed no evidence of protective antibodies and died of hog cholera.

Only 3 pigs from gilt 4 (serum and virus) were available for challenge due to the presence of acute dermatitis (greasy

TABLE 2—Length of Survival in Suckling Pigs Challenged with Hog Cholera Virus

Immunization of dam (age and type)	Survival time in days by challenge periods*			
	4 weeks	6 weeks	8 weeks	10 weeks
No. 1				
Control—not vaccinated	(5) (8)	(13) (13)	(8) (8)	(9) (8)
No. 2				
Vaccine (2 ml.) at 6 weeks of age	(13) (11)	(8) (12)	(8) (8)	(6) (6)
No. 3				
Vaccine (2 ml.) when 6 weeks of age	(Survived)	(Survived)	(Survived)	(6) (7)
and 90 days pregnant	(Survived)	(Survived)	(16)	
No. 4				
Antiserum and virulent virus at 6 weeks of age	(Survived)	(Survived)	(14)	.....

*Survival time is shown in parenthesis for each pig.

pig disease) in the litter. The pigs injected with virulent virus at 4 and 6 weeks of age survived with no evidence of leukopenia, febrile response, or inappetence. The pig challenged at 8 weeks of age showed little evidence of passive immunity and died in 14 days.

Gilt 5 farrowed 1 pig and 2 weeks later, due to superfetation, farrowed 11 pigs. Her milk appeared to contain no colostrum at the second parturition. Electrophoretic determinations of plasma proteins in the blood serum of these pigs revealed only a slight increase in *gamma* globulin after nursing when compared to pigs which got colostrum (graph 2). When challenged at 4, 6, 8, and 10 weeks of age, no measurable degree of passive immunity was evident. Therefore, the data obtained from these pigs was omitted.

DISCUSSION

There appeared to be some anamnestic response from a second immunizing dose of the vaccine which resulted in increased passive immunity in the pigs of gilt 3. The pigs from gilt 4, given antiserum and virus, did not have the duration and degree of protection that was reported in the earlier work;[2] however, pigs of gilt 4 showed much greater persistence of protective antibodies than pigs of the sow singly immunized with vaccine at 6 weeks of age.

There was no clinical evidence of any disturbance of the dams when subsequent doses of the vaccine were given, during pregnancy and two weeks after farrowing. It appeared that there was no interference which might cause neonatal mortality or suppressed milk supply, as all pigs were vigorous at birth and remained so during the critical early days of life.

Some individual differences in apparent antibody protection occurred in pigs in the same litter when challenged at the same age. This may possibly be due to these pigs obtaining unequal amounts of colostrum.

Because only small numbers of pigs were available for challenge, further studies of congenital immunity in young pigs are in progress.

SUMMARY

A preliminary study of the duration of passive immunity to hog cholera in pigs whose dams were immunized with antiserum and virulent virus, or with one or more doses of a modified live virus vaccine (Rovac), indicated the following: (1) A single dose of the vaccine at 6 weeks of age gave only slight evidence of protection in the offspring and they all succumbed when challenged; (2) doses of the vaccine at 6 weeks of age and when 90 days pregnant resulted in a resistance to challenge at 4 and 6 weeks of age, and in 1 of 2 pigs at 8 weeks of age; and (3) vaccination with antiserum and virulent virus at 6 weeks of age produced sufficient passive antibodies to enable the offspring to withstand the four- and six-week challenge.

The pigs of the gilt which was given the vaccine when 6 weeks of age, 90 days pregnant, and two weeks postpartum were the result of superfetation, obtained no colostrum, lacked *gamma* globulin, and consequently all failed to survive.

All pigs from the unvaccinated control gilt died when challenged.

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Transplacental Transmission of Poliomyelitis.—Experiments with the meconium and cord blood from six infants, born to mothers suffering from acute poliomyelitis, resulted in isolation of the virus from the meconium of three but from the cord blood of none. Two of the three infants from which virus was isolated were delivered by abdominal incision immediately after the death, from poliomyelitis, of the mother. These three cases, with a few others reported, in the literature, demonstrate that intrauterine infection with poliomyelitis virus does occur, and they support the concept that viremia is a feature of this disease.—*J.Am.M.A. (Nov. 30, 1957): 1747.*

Human deaths from tuberculosis, in Britain, have been reduced from 50 to 12/100,000 population in the past ten years and is still declining.—*J.Am.M.A. (Nov. 30, 1957): 1738.*

Intramuscular Treatment of Staphylococcic Mastitis with Neomycin Sulfate and Polymyxin B Sulfate

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Bristol, Tennessee

Staphylococcus aureus is commonly found in milk of dairy cows, especially in large herds. It may be found in milk of more than 50 per cent of cows of a herd. However, not all such animals are actively infected; penetration of the organism into the tissues of the mammary gland is necessary before a true infection exists and mastitis can be produced.

It has been a practice of some laboratories to report a sample of milk as coming from an infected quarter when *Staph. aureus* is observed. This has caused considerable loss to the farmer and has resulted in needless waste. The uncontrolled treatment of these cows, by the farmer, has resulted in a rapid development of resistance by this organism to the more widely used mastitis preparations.

This report deals with a case where, because *Staph. aureus* was found in milk, the cows had been treated with penicillin, penicillin and streptomycin with sulfonamides, and with chlortetracycline. As a result, the organism developed resistance to these agents and, when mastitis developed, the elimination of the infection became a difficult task.

MATERIALS AND METHODS

Milk samples, from the cows with mastitis, were plated on brain-heart infusion agar and identified as *Staph. aureus* by established procedures.[2]

Staphylococcus aureus was checked for its sensitivity to different antibiotics by use of sensitivity disks,* which were placed on inoculated agar. The plates were incubated for 20 hours at 37 C. and checked for zones of inhibition. Because of the slower rate of diffusion of some antibiotics, evidence of inhibition zones and not zone size was used as a criterion of sensitivity or resistance.

RESULTS

Each culture was tested for its sensitivity (table 1). The cultures were all *Staph. aureus* and will thus be reported by number.

There have been numerous reports on the synergistic activity of neomycin† and polymyxin B when the two are combined.[1,3] For this reason, each cow was treated by intramuscular injection of 1 Gm. of neomycin sulfate and 1,000,000 units of polymyxin B, in aqueous solution,§ each day for two days. Seventy-two hours after the last treatment, milk samples were again collected and plated out to determine the presence or absence of *Staph. aureus*.

Of the original 9 cows treated, 8 responded to treatment and the milk was completely void of this organism on the 72-hour cultures. These cows showed no signs of mastitis after 48 hours and were still normal two weeks later.

The ninth cow failed to respond to therapy and the organism was still present. This cow was isolated and treated intramuscularly with penicillin, 3,000,000 units per day for three days. The organism was still present in samples collected 72 hours after the last treatment. The cow also failed to respond to intramammary infusion of the tested antibiotics. The clinical

TABLE 1—Sensitivity of Staphylococcus Aureus to Seven Antibiotics

Organism No.	Penicillin	Streptomycin	Chlortetracycline	Tetracycline	Erythromycin	Neomycin	Polymyxin B
1	R*	R	R	R	S†	S	R
2	R	R	R	R	R	S	R
3	R	R	R	R	R	S	R
4	R	R	R	R	R	S	R
5	R	R	R	R	R	S	R
6	R	R	R	R	R	S	R
7	R	R	S	S	S	S	R
8	R	R	R	R	R	S	S
9	R	R	R	R	R	S	S

*R = resistant; † = sensitive.

From the Research Department, S. E. Massengill Co., Bristol, Tenn.

*Supplied by Baltimore Biological Laboratories, Baltimore, Md.

†Neomycin sulfate is produced by the S. B. Penick Co., New York, N. Y.

§This combination is produced by the S. E. Massengill Co. under the trade name Daribiotic Injection.

signs of mastitis persisted, so the cow was disposed of.

CONCLUSIONS

The mere presence of *Staph. aureus* in milk does not always indicate the presence of an active case of staphylococcic mastitis. Active mastitis should be diagnosed only when clinical signs of infection accompany positive cultures.

When staphylococcic mastitis has been diagnosed, the organism should be checked for its sensitivity to different antibiotics. Failure to do this may increase the number of strains that resist common methods of treatment. The "shot-gun dose" of antibiotics is the easy method of treatment, but it is also the easy way to increase the resistance of staphylococci species.

When cows with mastitis fail to respond to intramammary treatment, intramuscular therapy should be instituted with an antibiotic which is active against the organism.

SUMMARY

1) In 9 cows, mastitis, due to strains of *Staphylococcus aureus* which were resistant to most antibiotics, failed to respond to treatment with these antibiotics.

2) Neomycin sulfate and polymyxin B sulfate combination, intramuscularly, was found to be effective against mastitis in 8 of the 9 cows treated.

3) Neomycin alone apparently would have been effective.

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Will Asian Influenza Be a Dual Infection Like Swine Influenza?—Whether the recent epidemic of Asian influenza may repeat the pattern of the 1918 epidemic, of which the first wave was mild and apparently due to uncomplicated virus infection while the second wave was serious due to complication with the hemophilus influenzae bacillus, is a question recently discussed by Richard E. Shope, M.D. It was while searching for an explanation of this that Dr. Shope discovered that a simultaneous virus and bacterial infection caused influenza in swine.

There is serological evidence that the human population has not been previously exposed to the Asian virus, also that few of these cases are complicated with bacterial infection; but, if history repeats, the next wave of infection may be complicated and the results may be more serious.—*Philadelphia Bull., Dec., 1957.*

Fatal Myocarditis Due to Trichinosis

Among reported cases of trichinosis in man, the mortality is estimated at 6 per cent, due predominantly to involvement of the heart. A case in a young man, which was not diagnosed until necropsy, is reported. At the onset, muscular weakness, cough, chills, and fever started concurrently and, three weeks later, the patient was bedridden and had a sore throat, loss of appetite, pain in the shoulders and hips, and occasional mild headaches and vomiting. Death occurred after five weeks of illness. At necropsy, the heart was flabby and dilated.

Microscopic examination revealed focal disseminated myocarditis and collections of inflammatory cells with eosinophils predominating. There was a remarkable scarcity of the parasites in the muscle tissues, which indicated considerable maladjustment between the parasite and host—a "violation of the basic principles of parasitism." Apparently, the parasite induced a supersensitive response on the part of the host and caused extinction of itself as well as of the host.—*J.Am.M.A. (Dec. 7, 1957): 1826.*

Digestion and Distribution of Blood Flow.—That splanchnic blood flow increases at the expense of flow in other organs during digestion has been disproved. In 1941, it was shown that the circulation increased to the human hand and leg after eating. Now, using traceable material injected intravenously in rats, it has been demonstrated that during digestion there is a uniform increase in the blood flow to all organs; the result of an increase in cardiac output.—*Science (Dec. 6, 1957): 1176.*

Congenital Porphyria (Pink Tooth) in Holstein-Friesian Calves in California

EDWARD A. RHODE, D.V.M., and CHARLES E. CORNELIUS, D.V.M.

Davis, California

CONGENITAL PORPHYRIA is a rare inborn error of metabolism, in man and animals, in which abnormally high levels of porphyrin pigments of isomeric series I circulate in the blood and are deposited in the tissues of the body. The deposition of these abnormal porphyrins produces a reddish brown discoloration of the teeth, the bones, and of nearly all the soft tissues. Additional clinical signs are reddish brown urine, anemia, retarded growth, and dry scablike skin lesions due to the photosensitizing nature of the porphyrins.

Fig. 1—Skin lesions in nonpigmented area of calf 1 with congenital porphyria, showing scaling and alopecia confined to nonpigmented areas.

This condition in living cattle was first observed and reported, in 1936,[5,10] in a grade Shorthorn herd in South Africa (Swaziland). After a series of breeding experiments, it was concluded[6] that the disease was inherited as a simple Mendelian recessive character and followed the introduction of a purebred stock bull.

After extensive chemical examination of the porphyrins in the blood, feces, urine, and tissues in these cattle, it was postulated[10] that the disease was most likely due to a failure or inhibition of a selectively catalyzed enzymatic reaction which normally results in the elaboration of adequate quantities of series III porphyrins, the precursors of hematin. Due to an abnormal formation of nearly equal amounts of porphyrins of both isomeric series I and III, the level of porphyrin synthesis is raised in an attempt to produce adequate protoporphyrin III for hemoglobin synthesis. This process results in the flooding of the useless series I pigments into the organism, which accounts for the clinical manifestations.

In 1944, the occurrence of congenital porphyria was recorded in New Zealand pigs,[3] and more recently (1955) in both pigs and Shorthorn cattle in Denmark.[8] In England, in 1956, young Shorthorn cattle with congenital porphyria were observed and demonstrated to the Physiological Society.[1]

This report contains clinical and laboratory data concerning the occurrence of congenital porphyria in 2 grade Holstein-Friesian heifer calves observed, in 1955, from different dairy herds in California.

CLINICAL SIGNS

Calf 1.—This heifer, 3 months old, was referred to us* with a complaint of skin lesions of two months' duration, dark urine, and poor growth. The calf was observed for one month and then killed for necropsy. It was small for its age and in poor condition despite a good appetite and active appearance. The white areas of the skin, particularly those of the back (fig. 1), were scaly, crusty, and hairless. The white hair at the fetlocks was mouse colored. The

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*Calf 1 was referred by Dr. Jack Woolsey, Santa Rosa, Calif.; calf 2 by Dr. Wyland Cripe, Elk Grove, Calif.

mucous membranes were pale and the teeth were reddish or orange brown (fig. 2). The teeth fluoresced with a Wood's ultraviolet light.

Calf 2.—This heifer, 5½ months old, was referred to us* from another herd with a history of posterior paralysis of two weeks' duration. The calf was able to support its weight on the hindlimbs only when assisted, and within a few days was unable to stand. Sensory perception as well as spinal reflexes were intact. A spinal cord lesion in the posterior thoracic or lumbar area was suspected. There were crusty, scaly areas around the nose and rectum; also, alopecia with skin necrosis and scaling over an area of white hair in the hip region. The teeth were reddish brown, similar to those of calf 1, and the urine was reddish brown, although not as dark as in calf 1.

Fig. 2—Teeth of calf 1, showing reddish brown discoloration.

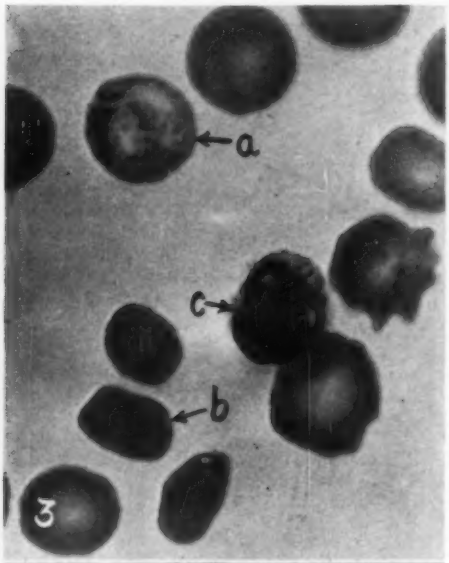
LABORATORY FINDINGS

Both calves exhibited a macrocytic normochromic anemia. The mean corpuscular volume (MCV) was 62.0 and 60.7 cμ, respectively, as compared to the mean normal value of 27.7 to 38.8 cμ.[11] Red blood cell counts, morphology, and mean corpuscular hemoglobin concentration (MCHC) are presented (table 1). The poikilocytosis, polychromatophilia, and basophilic stippling of the erythrocytes were similar to that described previously[5] (fig. 3, 4). The differential counts did not show an increase in the percentage of eosinophils as did the cattle with congenital porphyria in South Africa which were infested with Bilharzia, Theileria, and Piroplasma.[6] An increase in the percent-

TABLE 1—Hematological Findings in 2 Holstein-Friesian Calves with Congenital Porphyria

Calf No. Sex Age	Cell count		Differential count						Hemoglobin Gm./100 cc.	Nucleated r.b.c./100 w.b.c.	Reticulocytes (%)	Wintrobe Hematocrit	MCV[3] (cμ)	MCHC[4] (%)	Erythrocytes (morphology)
	r.b.c.[1] 10^6/cmm.	w.b.c.[2] 10^3/cmm.	Bands	Neut.	Lymph.	Mono.	Eos.	Unclassifiable							
4-2-55 1 Female 3 mo.	2.42	14.0	0	17.0	58.0	24.0	1.0	0	5.0	78.0	2.8	15.0	61.5	33.0	Marked polychromatophilia, poikilocytosis, anisocytosis, basophilic stippling, macrocytes, target cells
7-2-55 1 Female 3 mo.	2.55	14.8	1.0	9.0	48.0	33.0	4.0	5.0	4.8	30.0	....	14.0	62.0	34.0	Marked polychromatophilia, poikilocytosis, anisocytosis, basophilic stippling, macrocytes, target cells
12-3-55 2 Female 5½ mo.	3.42	10.5	0	25.0	57.0	18.0	0	0	6.7	32.0	3.6	21.0	60.7	31.9	Marked polychromatophilia, poikilocytosis, anisocytosis, basophilic stippling, macrocytes, target cells
Normal control calves 3½–6½ mo. Mean value (7)	13.1	7.5	0	28.2	61.2	8.0	0.8	0	11.0	0	0	36.2	27.6	30.6	Anisocytosis, occasional polychromatophilic cell

[1]Red blood cells per 1,000,000 cmm.; [2]white blood cells per 1,000 cmm.; [3]mean corpuscular volume; [4]mean corpuscular hemoglobic concentration.



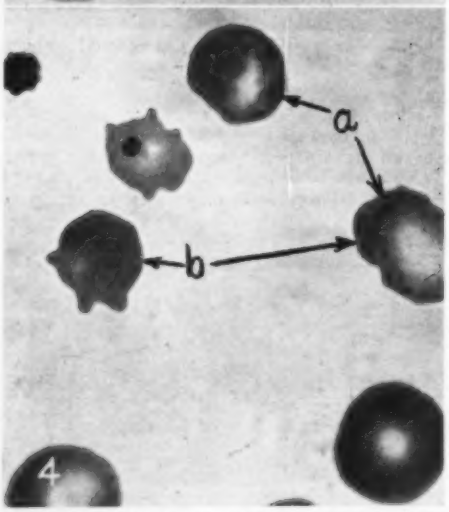


Fig. 3—Blood film of calf 1 with congenital porphyria. Observe the basophilic stippling (a), poikilocytosis (b), metarubricyte (c), and anisocytosis (cells of various sizes). x 1,800.

Fig. 4—Blood film of calf 2 with congenital porphyria. Observe basophilic stippling (a), poikilocytosis (b), and anisocytosis (cells of various sizes). x 1,800.

age of monocytes as compared to normal values, however, was noticed in the present study which is in agreement with previous reports.[5,6]

Hyperactive erythropoiesis was evident from the presence of many metarubricytes and reticulocytes

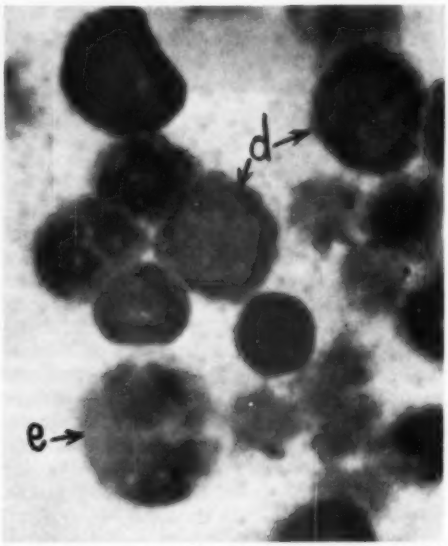


Fig. 5—Bone marrow film from iliac crest of calf 2 with congenital porphyria. Notice the macrocytic rubricytes (d) and numerous mitotic cells (e). x 1,800.

in the peripheral blood (table 1). Stained bone marrow, aspirated from the iliac crest of calf 2, revealed the presence of distinctly macrocytic cells of the rubricytic series (fig. 5). Hemoglobin deposition was occasionally observed in the prorubricytes. The total bone marrow nucleated cell count was 316,000 cells per cubic millimeter, with a myeloid-erythroid ratio estimated at 0.1, which was obscured by the presence of many fragile and disintegrating blast cells. Myeloid-erythroid ratios in cows have been found to range from 0.27 to 2.59 with a mean of 0.68,[2] which is considerably higher than that observed in this study. In another study,[10] myeloid-erythroid ratios averaged 0.64 $\pm$ 0.13 in cattle between 2 months and 10 years of age and 0.47 $\pm$ 0.06 in calves 3 to 36 days of age. Mitosis of bone marrow cells in the heifers with congenital porphyria was observed to be present in 9 per cent of the cells as compared to normal mean values of 1 per cent for cows[2] with a range from 0 to 2.2 per cent. The mitoses were confined mainly to the rubricytic series. There is need for more complete data on normal myeloid-erythroid ratios and mitosis in cattle of all ages and breeds. Erythrocyte fragility tests in both calves gave complete hemolysis of the cells in NaCl concentration of 0.36 per cent. Since normal fragility values for bovine red blood cell hemolysis range from 0.42 to 0.59 per cent NaCl,[4] the erythrocytes in congenital porphyria were not of a fragile nature. The presence of a short erythrocyte life span is probable. This opinion is based on the evidence that immature erythrocytes, which contain the abnormal type I uroporphyrin, are readily phago-

TABLE 2—Quantitative Determinations for Urinary Porphyrins

	Uroporphyrin I (γ/100 cc.)	Uroporphyrin III (γ/100 cc.)	Coproporphyrin (γ/100 cc.)	Porphobilinogen (γ/100 cc.)
Calf 1	500	Neg.	356	Neg.
Calf 2	1,640	Neg.	1,530	Neg.
Normal control	Neg.	Neg.	1.84	Neg.

cytized in the bone marrow and spleen,[7] with the release of uroporphyrin I into the circulation and its excretion into the urine. Splenomegaly was found in calf 1; microscopic examination revealed a reticuloendothelial hyperplasia of the red pulp.

The urine of calf 1 was reddish brown and translucent, with a few flocculent particles present. The specific gravity was 1.012 Gm. per milliliter with a pH of 6.0. Protein, acetone, glucose, and bile pigments were all absent from the centrifuged urine. In the microscopic examination of the sediment, a few erythrocytes and bacteria were seen intermixed with many large and small clumps of pus cells.

Quantitative determinations* for urinary porphyrins are given (table 2). The presence in the urine of large quantities of uroporphyrin, of the abnormal isomeric series I, and of a high level of urinary coproporphyrin in the absence of any porphobilinogen or uroporphyrin III agrees well with the findings in Shorthorn cattle of South Africa.[5,10] However, urinary porphobilinogen was also found intermittently in bovine congenital porphyria in Denmark.[5]

Both serum proteins and total blood iron values were within the normal limits in these calves.

At necropsy, all bones of both calves were dark brown. The cortex of nearly all the bones, including the vertebrae, appeared thinner than normal with an increase in the amount of marrow and marrow cavity (fig. 6). The bone marrow was dark red, juicy, and friable. The paralysis of calf 2 was a result of a compression fracture of the first lum-

*The authors thank Dr. L. A. Strait, University of California Medical School, San Francisco, for the analysis of the urinary porphyrins.

Fig. 6—Bones of calf 2 showing reddish brown discoloration and thin cortices.

bar vertebra, accompanied by necrotizing myelitis. In addition, epiphyseal fractures of the right eleventh and twelfth ribs were observed with excessive bony proliferation at the fracture sites.

DISCUSSION

The typical clinical signs of reddish brown urine and teeth and skin lesions of photosensitization, coupled with increased amounts of series I porphyrin pigments, establishes these cases as congenital porphyria. Unfortunately, it was not possible to trace the ancestry of either of these calves. It is of interest that 2 apparently unrelated animals with porphyria should come to our attention within a short period of time. The condition can be expected and is being seen[9] in the Holstein-Friesian breed. The clinical signs are consistent enough to make an accurate diagnosis possible.

The presence of pathological fractures of a lumbar vertebra and ribs in calf 2 would suggest an increased fragility of the bones. This was indicated by the diminished cortex of all bones in both calves.

SUMMARY

Two cases of congenital porphyria are reported in Holstein-Friesian calves. Clinical signs observed were a macrocytic normochromic anemia, retarded growth, lesions of photosensitization, reddish brown teeth, bones, and urine, and the presence of pathological fractures. Blood and urine analyses and pathological findings are reported.

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Congenital Porphyria in Cattle

Congenital porphyria is rare in man, only 35 cases having been reported. This condition was recognized in cattle in 1936 and, since then, in swine. In July, 1956, in Britain, a 2-year-old Shorthorn heifer which had purplish-red teeth developed crusty sores on her back, suggestive of photosensitization, when turned to pasture in the spring. Her urine and feces were rich in porphyrins. The records indicated that 2 other cases in the herd had been undiagnosed in closely related heifers and inspection revealed 2 more cases in young calves, 1 a full sister of the heifer observed. The calves had discolored teeth and pinkish urine which was rich in porphyrins. The fluorescence of the teeth in ultraviolet light was fiery red, and the blood plasma showed red fluorescence. Since this was a pedigreed herd, the hereditary factor was readily established.—*Nature (Aug. 3, 1957)*: *230*.

Cervical Actinomycosis in a Child.—A 3-year-old girl was hospitalized ten days after developing a sore throat and a fever of two days' duration. Her temperature was 100 F., and a band of subcutaneous nodules could be traced from a red and indurated but nonfluctuating area in the submaxillary space to a raised, reddish, fluctuant, nodular area in the left supraclavicular area. A few drops of yellow pus were aspirated from these lesions but cultures were negative until clumpy colonies appeared in thioglycollate broth after seven days of incubation. The gram-positive branching filaments with clubbed ends were identified as a strain of *Actinomyces bovis*. After 12 days of oral therapy with tetracycline, recovery was complete.—*Antibiotic Med. and Clin. Therapy (Nov., 1957)*: *755*.

An Electrical Apparatus and Its Application in Defibrillating the Heart of the Dog

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THE APPLICATION of intense electrical shocks of short duration to abolish ventricular fibrillation in the dog was first presented in 1899.[16,17] After a lapse of some 30 years, interest was again revived in this area of study[5,22,24] which finally led to its application in human medicine.[2] Although there have been many publications of an experimental nature on small[1,5,6,11,13-17,20,23,24] and large animals,[4] the veterinary practitioner has not had a simple means available for defibrillating the heart. In view of this, a description of the assembly and application of an electrical apparatus which has been used to defibrillate the ventricles of the dog is reported herein. Moreover, certain supportive measures which are considered important for successful cardiac resuscitation are described.[7,9]

DESCRIPTION AND APPLICATION OF THE DEFIBRILLATOR

The principal parts required for assembly of the defibrillator consist of a Powerstat variable transformer,* ammeter,** and electrodes. The alternating current variable transformer has a range of 0 to 100 volts; the ammeter has a range of 0 to 5 amperes. The electrodes are made of brass, with a diameter of 8 cm.[2] and are 0.83 mm. in thickness. The electrical circuit (fig. 1) and the assembled apparatus (fig. 2) are shown. Application of the defibrillator consisted of connecting it to a 110 to 115 volt line with an alternating current of 60 cycles per second. The electrodes were covered with saline-soaked gauze to prevent epicardial[12] and myocardial burning. The transformer control was set between 70 and 90 volts. The electrodes were then placed on each side of the heart and the transformer switch was turned on and off, delivering a shock which lasted only a fraction of a second. This allowed 2 or more amperes of current to flow through the myocardium, which was sufficient to stop fibrillation.

PROCEDURE AND RESULTS

Experiments were conducted on 21 dogs to determine the effectiveness of the apparatus in defibrillating the ventricles. All of the experiments were conducted on a nonsurvival basis except in 5 animals. One of the 5 survival dogs failed to recover, even though defibrillation of the ventricles was successful; this failure was attributed to inadequate medication and respiratory ventilation.

In an effort to simulate practice conditions, cardiac arrest or fibrillation were induced by administering an overdose of sodium pentobarbital intravenously (35-60 mg. per kg. of body wt.) until respiratory arrest occurred. This procedure was used on all but 1 dog. This animal was given an anesthetizing dose of sodium pentobarbital intravenously, which did not produce respiratory paralysis or cardiac arrest, and a kymographic tracing was made to show the effects of fibrillation, massage, and defibrillation upon the blood pressure (fig. 3). In 20 animals, respiration was completely arrested by the sodium pentobarbital, and the resultant hypoxia, hypercapnia, and acidosis soon led to complete arrest of the heart or its fibrillation. Only the animals employed in the survival study were given atropine sulfate and

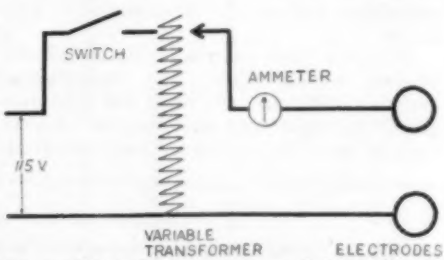

Fig. 1—Electrical circuit diagram of the cardiac defibrillator.

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Approved for publication by Colorado State University.

*The Powerstat variable transformer was obtained from the Superior Electric Co., Bristol, Conn.

**The ammeter was obtained from the Allied Radio Corp., Chicago, Ill.

Fig. 2—Assembled cardiac defibrillator showing top (a) and bottom (b) surfaces of electrodes.

morphine sulfate for preanesthetic purposes.

In order that oxygen could be administered without delay, an endotracheal catheter with an inflatable cuff was routinely inserted into the trachea of each animal prior to complete respiratory arrest. When the heartbeat and pulse were no longer perceptible, 100 per cent oxygen was administered under positive pressure and a thoracotomy was rapidly performed on the left side. No special attempt was made to discern the proper rib interspace. In an emergency such as this, there was

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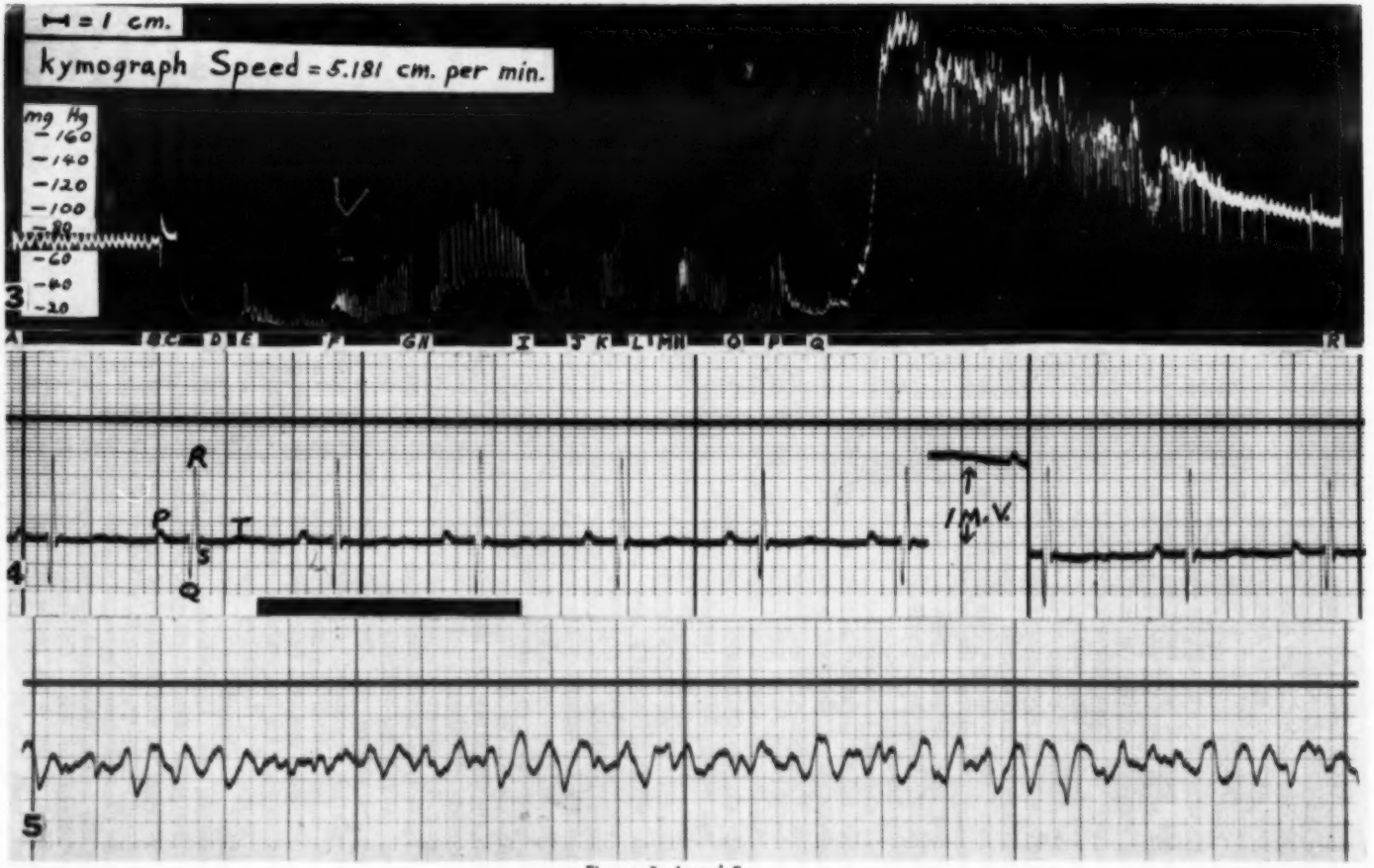
Fig. 3—Kymographic tracing showing the effects on blood pressure: blood pressure following sodium pentobarbital anesthesia and thoracotomy (A); placement of thyratron stimulator electrodes on the ventricles for inducing fibrillation (B); electric shock of 150 volts and 30 frequency delivered (C); electric shock discontinued showing a static blood pressure of a few mm. Hg. during ventricular fibrillation (D); demonstration of poor or ineffective massage (E); beginning of more effective massage (F); massage discontinued and 2 cc. of 1:10,000 epinephrine hydrochloride injected into the right ventricle (G); massage resumed following the epinephrine injection (H); massage discontinued with placement of the electric defibrillator electrodes on the heart (I); a shock of 70 volts which failed to defibrillate the ventricles (J); massage instituted again (K); massage discontinued with replacement of the electric defibrillator electrodes on the heart (L); a shock of 80 volts again failed to defibrillate the ventricles (M); massage continued again (N); massage discontinued with replacement of the electric defibrillator electrodes on the heart (O); a shock of 90 volts successfully defibrillated the ventricles; note the return of the beating of the heart (P); 2 cc. of 1:10,000 epinephrine hydrochloride injected into the right ventricle (Q); effects of epinephrine have nearly subsided with return of the "normal" blood pressure and beating heart (R).

Fig. 4—A normal electrocardiographic tracing (lead I) of a dog anesthetized with sodium pentobarbital, lying on its right side. Note the normal pattern with the presence of P, Q, R, S, and T waves; the calibration impressed upon the tracing is equal to 1 millivolt.

Fig. 5—An electrocardiographic tracing (lead I) of a dog anesthetized with sodium pentobarbital, lying on its right side, during ventricular fibrillation. Note the absence of the normal waves.



Figures 3, 4, and 5

no time to observe strict asepsis or to prepare the surgical field.

The thoracotomy required only a few seconds and was performed without active hemorrhage. After the chest was opened, the heart was massaged at a rate of 45 to 50 times per minute by compressing it in the palm of one hand or against the right chest wall with two or more fingers. The rate was similar to that employed by others.[11,14,20] Even though the heart was massaged forcibly, caution was exercised to avoid undue damage to the myocardium. With each "diastolic movement," the heart was allowed to relax fully to assure proper filling of the ventricles (fig. 3). During the massage procedure, the abdomen of the animal was usually "milked" or stroked with one hand to enhance venous return to the heart.

If forceful ventricular contractions failed to occur after a few minutes of massage, or if the ventricles were fibrillating, the pericardium was opened ventral to the phrenic nerve and the massage was continued. Massage was reported to be most effective with an open pericardium.[12] In our study, 19 of the dogs manifested cardiac arrest without ventricular fibrillation and all of these responded to massage without incising the pericardium. Ventricular fibrillation was subsequently induced in these dogs in order to determine the effectiveness of the electric defibrillator. Two of the 21 dogs in this study showed spontaneous ventricular fibrillation at the time of the thoracotomy, thereby obviating the need for artificially induced fibrillation. Electrocardiograms (fig. 4, 5) indicate the electrical deflections of heart activity obtained prior to and during ventricular fibrillation, respectively. The procedure for inducing ventricular fibrillation consisted of stimulating the ventricles with a thyratron stimulator set at 150 volts and at a frequency of 30 cycles per second. An intracardiac injection of 2 to 4 cc. of 1:10,000 epinephrine hydrochloride, followed by a few minutes of massage, was carried out prior to defibrillation in cases where the heart showed poor tone or was fibrillating weakly. Following the epinephrine injection, the heart was pressed firmly between the electrodes of the defibrillator, and one or more shocks delivered to the fibrillating ventricles proved effective in restoring the normal heartbeat. Compressing the heart firmly between the electrodes was reported to require less voltage to defibrillate the ventricles.[5]

Successful recovery was facilitated by administering intravenous fluids such as Ringer's solution or plasma expanders to alleviate the concurrent vascular collapse and probable hemoconcentration. Ringer's solution was considered of value, not only for minimizing hemoconcentration, but also for its electrolytes which are important for maintaining proper cardiac function.

In the survival animals, the chest was closed after making certain that the heartbeat was strong and forceful; the pericardium was not sutured. An antibiotic preparation containing penicillin and dihydrostreptomycin was placed in the chest cavity before closure and an additional injection was given intramuscularly twice daily for three to four days. Following the closure of the chest, air was aspirated from the thoracic cavity with a 50-cc. syringe connected to a 3-way stopcock. Then, oxygen was administered at the rate of 2 liters per minute by inserting a polyethylene tubing (inside diameter of 3 mm.) inside the endotracheal catheter to a point just above the tracheal bifurcation. In some animals, oxygen was administered by this method for over two hours before enough sodium pentobarbital was detoxified or eliminated to permit voluntary respiration. The dogs were kept warm with a thermostatically controlled heat lamp and their positions were changed frequently during anesthetic recovery to avoid respiratory complications. There was no evidence of infection and only 1 of the 4 surviving dogs showed brain damage. In this animal, vision was temporarily impaired, with normal sight returning after five days.

DISCUSSION

In this study, application of electric shocks to restore the normal beat of the fibrillating heart of dogs was successfully accomplished. Fibrillation of the ventricles in the dog may develop prior to or following cardiac arrest. When the ventricles are fibrillating, the heart muscle loses its power of effectual contraction and the individual muscle fibers beat independently and asynchronously in a fascicular manner. When palpated, the fibrillating heart gives the sensation of a "mass of wriggling worms." During the fibrillation process, the heart fails to eject blood from the

ventricles—hence the marked drop in blood pressure and absence of pulse (fig. 3). Valuable time should not be wasted in determining the presence of a pulse or heartbeat. Oxygen should be administered promptly under positive pressure and followed immediately with a thoracotomy. Intratracheal intubation should be a routine procedure in all animals subjected to general anesthesia since valuable time is thereby saved whenever artificial respiration is needed.

Of the 4 dogs which survived, 1 showed cerebral damage in the form of a temporary blindness. The interval between respiratory and cardiac arrest in this case was unusually long (10 min.). Similar observations of visual impairment in the dog were made by other investigators.[7,8] It is well known that the brain is extremely susceptible to hypoxia and that vision can become impaired with cerebral damage. It has been reported that the feline brain can withstand total ischemia for a maximum of three to five minutes without showing cerebral damage.[22] On the other hand, circulatory failure in the dog initiated by ventricular fibrillation has persisted as long as ten minutes without producing irreversible brain damage.[1]

It has been pointed out[5] that, if the heart of the dog is allowed to fibrillate for more than 1.0 to 1.5 minutes, it is unable to resume a normal beat even when defibrillation is successful. This critical time interval obviously depends upon the degree of hypoxia and can be extended safely in many cases. If a fibrillating heart is properly massaged and adequate oxygen is supplied, recovery can take place even though fibrillation continues much longer before treatment is begun. Age is apparently an important factor—young animals are much less susceptible to hypoxia than adult or aged animals.[10]

Many predisposing factors have been incriminated in causing ventricular fibrillation. The so-called "vagal reflex" as a cause for cardiac fibrillation or cardiac arrest has been emphasized in the literature, making it worthy of some discussion.[12] Initiation of the reflex is generally ascribed to surgical operations about the head, throat, neck, and chest.[6] This was reported to be one of the most important causes of cardiac standstill, and atropine sulfate was recommended as a prophylactic measure.[18] Vagal reflexes occurring during intrathoracic surgery were believed to be of little importance in producing cardiac accidents in patients given sufficient oxygen.[19] Dogs suffering from hypoxia were noticed to develop ventricular fibrillation with vagal stimulation.[21] Death was reported to occur frequently in dogs breathing 30 to 40 per cent carbon dioxide if the alveolar carbon dioxide tension was suddenly reduced by breathing room air.[5] It would appear that the vagal reflexes and carbon dioxide blood levels are important in producing cardiac arrest or ventricular fibrillation. Other predisposing factors might be impaired myocardial blood supply, respiratory embarrassment, the administration of an anesthetic agent, and massive hemorrhage.

The intracardiac injection of potassium chloride has been recommended for defibrillating the ventricles of the heart, followed by a stimulant such as calcium chloride, calcium gluconate, or epinephrine to re-establish the heartbeat.[8,23] These chemicals have been used with little success by the senior author in the dog and the pig. In our opinion, the most reliable and effective method of defibrillating the ventricles of the dog is the application of an electric shock of 2 or more amperes and of 70 to 90 volts. Ventricular defibrillation by the electric shock method has the distinct advantage that it can be employed immediately without loss of valuable time. Since few parts are needed to construct and assemble an electric defibrillator, the small animal practitioner can not afford to be without such an essential emergency device.

SUMMARY

An apparatus for electrically defibrillating the ventricles of the dog has been used successfully on 21 dogs. An alternating current of 2 or more amperes and 70 to 90 volts was sufficient to defibrillate the ventricles. Of the 21 experimental trials, 16 were conducted on a nonsurvival basis. Of the 5 survival animals, 1 failed to make a complete recovery following successful defibrillation of the ventricles; failure was attributed to inadequate medication and respiratory ventilation. Other supportive measures for successful cardiac resuscitation are discussed.

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Are Measles and Canine Distemper Related?—A close relationship between measles in man and canine distemper was indicated, at the University of California, when serum taken from patients recovered from measles protected mice against the distemper virus. Also, the measles virus was neutralized by anti-canine distemper serum.—*Sci. News Letter (Nov. 23, 1957): 326.*

A Bison-Brahman Hybrid.—A Louisiana breeder has 2 calves, a bull and a heifer born in January, 1957, with a Bison sire and Brahman dams. They are fawn brown with short hair and, at ten months, weighed about 550 lb. each. Unlike the sire, they are unaffected by insects and hot weather. If they are fertile, the owner hopes to cross them with other cattle breeds.— *The Cattleman (Dec., 1957): 63.*

Water Metabolism in Sheep.—Some sheep pass consistently lower urine volumes than others. There is a considerable variation in water metabolism in sheep, which is partly related to the potassium type of the red blood cells but other factors are also involved. An inheritance of this quality would have practical importance for sheep subjected to periodic droughts or exposed to semiarid environments.—*Nature (Oct. 12, 1957): 756.*

Drinking Ice Water After Abdominal Surgery.—The answer to an inquiry was that "icing the drink should do no harm." Cold water might stimulate peristalsis but it probably would be warm before it left the stomach.—*J.Am.M.A. (Nov. 30, 1957): 1770.*

An Experiment to Produce Coronary Occlusion in the Dog

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In the course of a series of experimental procedures concerned with revascularization of hearts damaged by coronary thrombosis,[2] the authors were faced with the necessity of producing a lesion comparable to that produced by a naturally occurring coronary occlusion. To solve this problem, the following technique was employed in a series of 5 dogs.

To insure adequate working space in the thorax, dogs weighing more than 45 lb. were selected.

Anesthesia was produced by a combination of a quick-acting barbiturate injection and gas inhalation. The barbiturate was introduced into the cephalic vein until the dog was sufficiently relaxed to permit easy passage of an intratracheal catheter with cuff attached. The cuff was then inflated and an ether and oxygen machine (Foregger, type F 9) was attached. To minimize loss of respiratory control through elasticity of the rebreathing bag, an infant-size bag was employed. It was manually operated while the thorax was open.

Each dog was fastened to an operating table in right lateral recumbency, with the forelegs drawn forward. The entire left side, from neck to hip, was clipped and prepared for surgery.

The incision extended through the fourth intercostal space from the edge of the longissimus dorsi muscle to the costochondral junction. Bleeding vessels were ligated with size A twisted nylon thread. The ribs were retracted as far as safely possible, and gauze packs (formed by sewing together partially unfolded 3-inch by 3-inch gauze sponges) were used to block the left lung away from the operative field. The pericardium was lifted and incised. The heart was then elevated, and a nylon suture was inserted under the descending branches of the left coronary artery and vein, about halfway between the bifurcation of the circumflex branch and the tip of the left ventricle, and tied.

While the heart was being manipulated, the rate of respiration was accelerated, since it had been observed there is less likelihood of ventricular fibrillation if the patient is hyperventilated while the heart is being disturbed. None of the 5 dogs showed any sign of fibrillation.

After the pericardium was sutured, the hemorrhage was mopped from the thoracic cavity, and the gauze packs were removed. Areas of atalectasis were massaged, the lungs were expanded to normal, and the retractors were removed. Tension sutures were placed around the fourth and fifth ribs, but were not tied until the ribs were approximated by Backhous towel clamps in the manner described by Markowitz.[1] After the anesthetist fully expanded the lungs to force air from the pleural cavity, interrupted sutures were placed in the subcutaneous muscles and fascia, and then tied. After the skin was sutured with 34-gauge stainless steel wire, a long hypodermic needle, attached to a syringe by means of a three-way stopcock, was inserted into the pleural cavity, and as much air as possible was withdrawn.

Healing was by first intention, but all 5 dogs showed some degree of soreness in the left shoulder and chest. After one month, thoracotomy was repeated on each dog, and a well defined area of infarction approximately 2 cm. in diameter, just distal to the suture, was found on the heart of each.

Dr. Hall is a small animal practitioner in Tampa, and Dr. Smith is a cardiovascular surgeon in Bradenton, Fla.

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Latent Virus Infections.—Apparently, there are many virus infections of animals, higher plants, and bacteria in the absence of signs of infection. When these viruses are activated by various stimuli, they cause confusion as to the true cause of a disease. Insect viruses, introduced into insects which are not their natural hosts, have activated a latent virus, thus starting a serially transmissible disease which is not essentially caused by the injected virus. (For such discussion with reference to infection, the terms latent, inapparent, subclinical, and masked should be redefined.) —*Nature (Oct. 19, 1957)*: *788*.

Thoracic Disorders in the Cat

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AMONG THE RIDDLES with which cats plague veterinarians, respiratory signs—snuffling, coughing, gagging, and dyspnea—rank high. Whether due to the pneumonitis virus or to other organisms only now being distinguished through tissue culture techniques, coldlike disorders usually constitute the chief respiratory trouble of cats. Yet precisely because this complex is so prevalent and so easily recognized, we often diagnose it hastily, slighting details of history and signs which clearly point elsewhere. The purpose of this paper is to call attention to nonviral conditions sometimes overlooked—several so "partial" to the cat as almost to constitute peculiarities of the species. Those involving the chest are the most numerous and significant, but for differential purposes several occurring in the upper respiratory tract will be mentioned.

Fig. 1—Nasopharyngeal growth in a cat. Where the posterior border of the soft palate has been trimmed away, a tumor is seen (arrow). Pedunculated nasal polyps sometimes grow backward till they hang over the soft palate and are visible when the throat is inspected.

HISTORY AND EXAMINATION

Unless acute choke or agonizing dyspnea suggestive of fluid in the chest demand immediate emergency measures, time should be taken to get a detailed history, and an owner's observations should never be dismissed as whimsy. If his cat "makes a noise like a goose honking," a mass of some kind may be blocking the posterior nares and depressing the soft palate. If the purr has changed or gone, the larynx may be the site of a tumor (usually lymphosarcoma), or of extension of a labial granuloma (so-called "rodent ulcer"). If a cat sits with its forelegs up on the bottom step of the stairs, there is likely some condition causing abnormal crowding of the lungs.

Learn in detail how the cat lives, what it eats and plays with, where it sleeps, what illnesses and treatments it has had. An old head injury, for instance, may have left a bone sequestrum in the frontal sinus; a cat may be "allergic" to its cushion or a certain summer plant; or a forgotten bout of pneumonitis may have left behind an intractable rhinitis.

Since a cat with respiratory trouble is uncomfortable, it should be handled gently and as little as possible. Let it choose its own position and then watch it. Its breathing motions and the sounds it makes often indicate at what level of the respiratory tract the trouble lies.

Evaluation of the color of the mucous membranes is not always easy. Pallor may mean hemorrhage in the thorax, but anemias of many kinds are common in the cat and, when severe, are always accompanied by a degree of respiratory difficulty. Jaundice sometimes accompanies pneumonic toxoplasmosis, but also occurs to-

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The pictures were taken by Dr. Gerald Sacks, and the radiographs by Miss Kathleen Driscoll.

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gether with dyspnea in severe hemolytic anemia or terminal leukemia. Cyanosis is a more dependable sign of respiratory trouble, indicating an obstructed airway, decrease in functional lung tissue, or crowding of the lungs by some disorder of the chest cavity.

The mouth should be examined for alveolar disease that may have extended into the nasal passages. Foreign bodies, inflammations, or swellings of the nasopharynx or larynx may often be glimpsed, but anesthesia is usually required for a thorough examination or for radiographs. If the soft palate appears depressed and resists pressure, examination under anesthesia and forward retraction of the palatal border may disclose a polyp, granuloma (e.g., cryptococcosis), or tumor (fig. 1).

The retropharyngeal lymph nodes, when swollen, abscessed, or tumorous, may exert enough pressure on the larynx, trachea, and esophagus to make breathing and swallowing difficult. Since they are deeply situated, such a condition is usually recognized only by means of a lateral radiograph.

The trachea is rarely a site of trouble. Luckily, foreign bodies are uncommon, since anesthesia must be dangerously deep to abolish spasm of the larynx, and attempts at removal with the unsuitable instruments available often fail or result in suffocation.

Far more significant in the cat than the upper respiratory problems just mentioned are disorders of the lungs and thoracic cavity. Often they are hard to diagnose, since cats adapt amazingly to limited pulmonary function. Little coughing may accompany the severest troubles, and conspicuous dyspnea may appear only terminally.

Because of the cat's small chest, thick fur, and sometimes its persistent purring, auscultation is frequently inconclusive. However, a substantial deviation from normal sounds is often recognizable, as well as the muffling which accompanies consolidation, tumor, or the presence of fluid.

DISORDERS OF THE LUNGS

Mild bronchitis and low-grade bronchopneumonia, often of uncertain origin, are rather frequent, to judge from radiographs and necropsies. Inappetence and variable

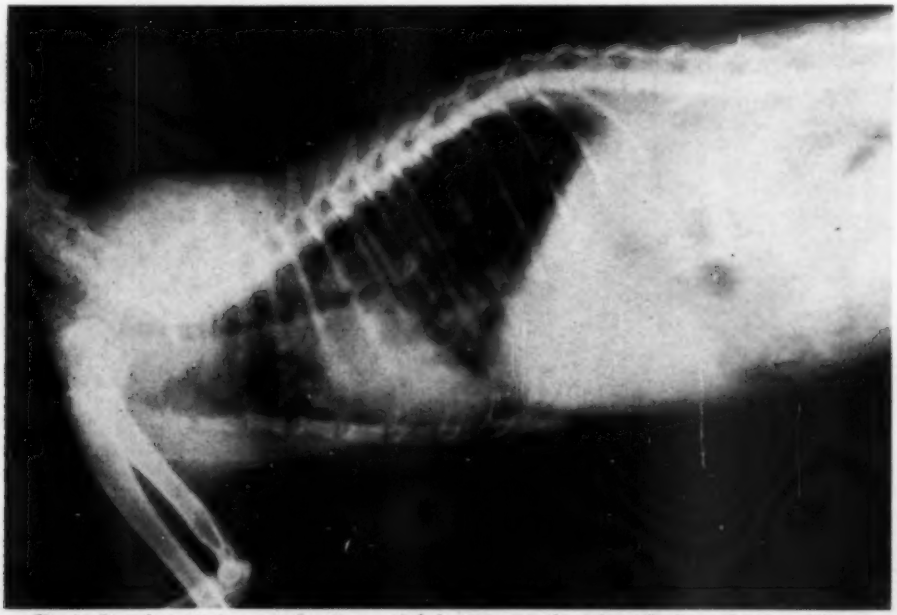

Fig. 2—Toxoplasmosis in a cat. Spotty areas of density occur throughout the lungs, but especially in the lower parts. At 1/3 second (this radiograph), rapid respirations cause blurring, but at 1/20 second the density would appear finer and more diffuse.

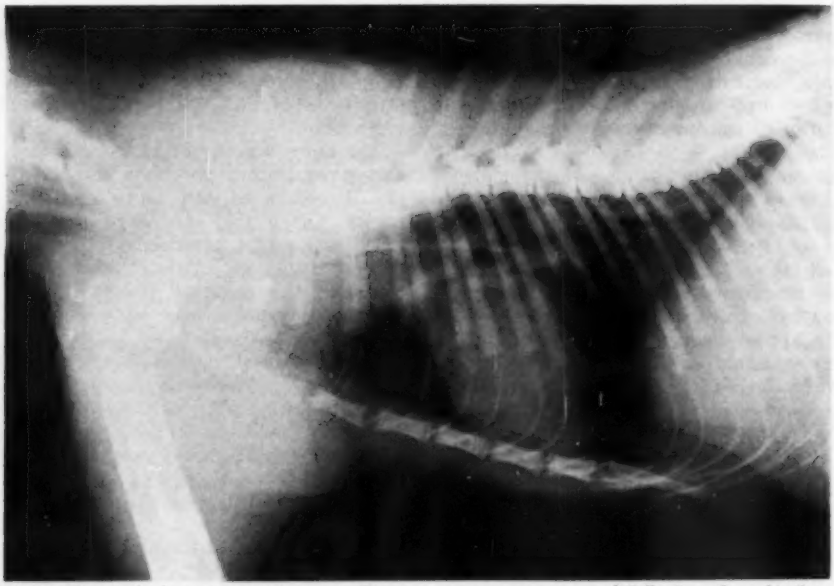

Fig. 3—Foreign-body pneumonia in a cat. The owner, a garage man, used Fullers' earth on his floor and also in his cat's pan. Streaky areas of density are evident in the upper parts of the diaphragmatic lobes.

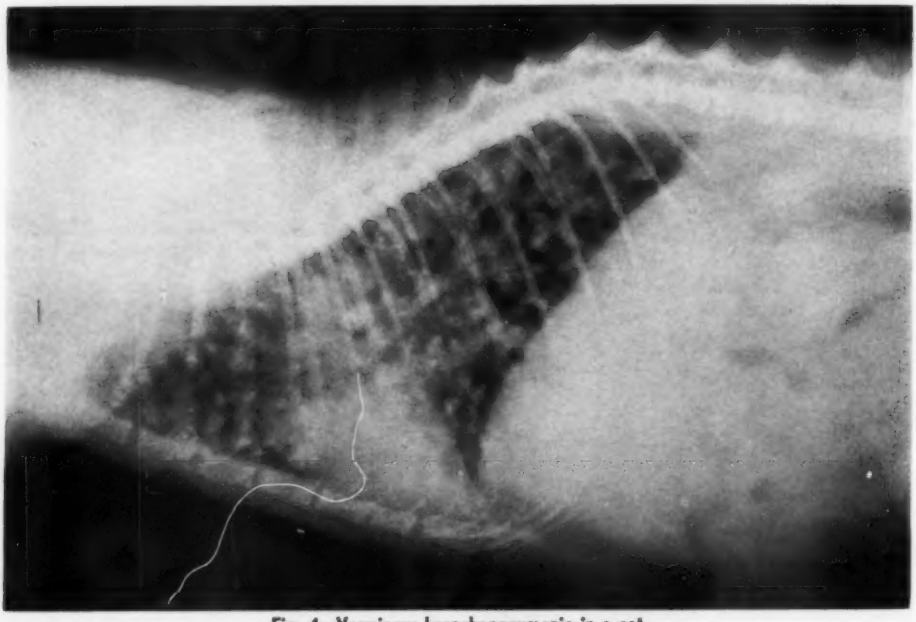

Fig. 4—Verminous bronchopneumonia in a cat.

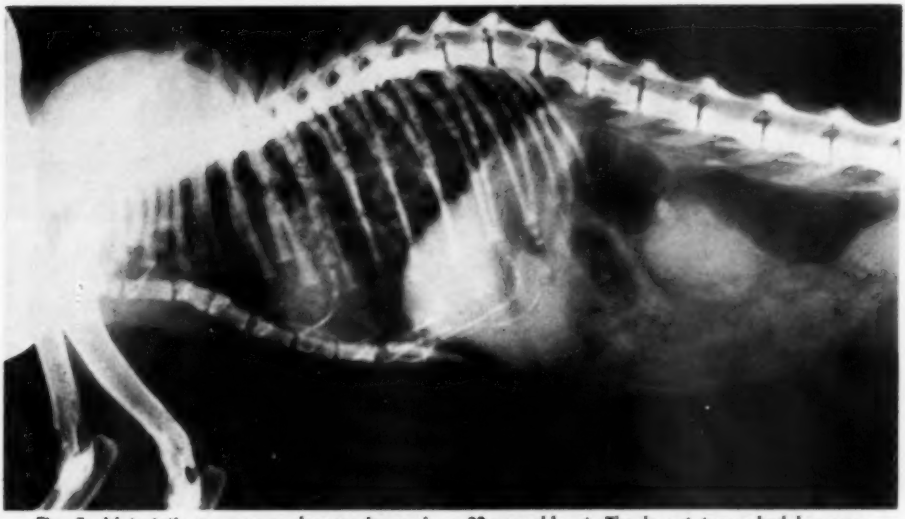

Fig. 5—Metastatic mammary adenocarcinoma in a 22-year-old cat. The breast tumor had been removed previously and did not recur.

fever, sometimes without cough or dyspnea, may be associated with radiographic findings of bronchial thickening or moderate focal shadows. Such conditions may be secondary to other disorders and, without radiographs, no doubt often go undiagnosed.

Acute febrile pneumonias with pronounced dyspnea are not common. The most characteristic pneumonia of this type occurs in toxoplasmosis in young cats: respirations are increasingly labored and strikingly rapid, lung sounds are loud and rasping, the temperature is about 104 F., jaundice may be present, and there is a tendency to leukopenia. Radiographs reveal diffuse spotty areas of density especially in the lower parts of the lungs, often leading to an incorrect diagnosis of inhalation pneumonia (fig. 2).

Foreign material is responsible for much bronchopneumonia in the cat. Mineral oil is the greatest offender, but other medication, forced feeding, and unsuitable material (such as Fuller's earth) used in a cat's sanitary pan may be to blame. There is a protracted "downhill" course with progressive weight loss, inappetence, and dyspnea. Fever is moderate and intermittent. Radiographs reveal gradual consolidation of the lungs, usually more pronounced in the lower parts (fig. 3). At necropsy, the lungs show the pale and homogeneous solidification of chronic interstitial pneumonia, or they are riddled with abscesses.

Mycotic and granulomatous pneumonias are infrequent. Tuberculosis, the first condition considered in many parts of the world when a cat has pneumonia or pleurisy, is almost unheard of in the United States.

Parasitic bronchopneumonia due to the lungworm Aelurostrongylus, and often severe enough to cause death, occurs in certain areas of the United States and elsewhere in the world. Live larvae are coughed up and appear in the stool. *Capillaria aerophila*, with eggs resembling those

Fig. 6—A towel with holes in it for the legs is a comfortable, unresented means of immobilizing a cat for radiography in the standing position. The attendant holding the sling "ducks" down behind the cassette and its support.

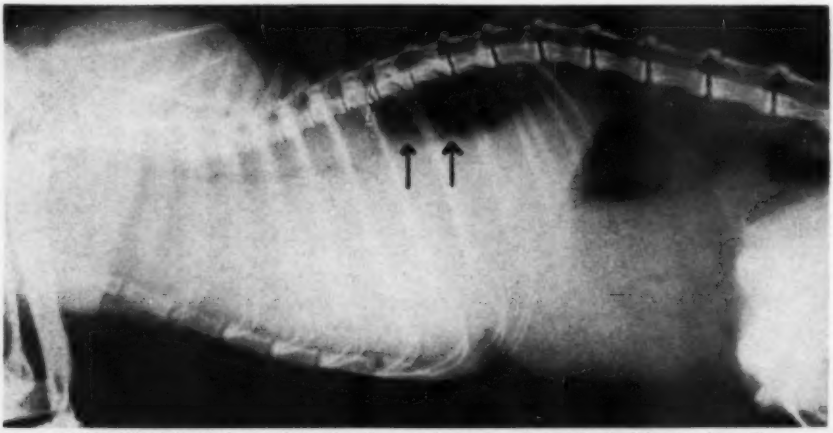

Fig. 7—High "fluid line" (arrows) in the thorax of a cat radiographed while standing. The cause could be hemothorax, chylothorax, empyema, a tumor, or heart or liver disease.

of the whipworm and bladder worm, is usually less pathogenic, provoking mild cough and slight lung changes. Severe pneumonia occasionally results from massive larval ascarid migration (fig. 4). Cough, fainting spells, bronchitis, and arterial thickening occur with heartworm. Eosinophilia may accompany any of these conditions.

Acute distress resembling that of "asthma" in man is occasionally encountered. These spells of alarming and agonizing dyspnea are without fever, and radiographs usually show little or no lung change. Emergency treatment with oxygen and adrenalin or atropine is usually followed by complete recovery, and long periods may pass before another attack. Response to cortisone is inconsistent.

Fig. 8—For tapping, a cat should be held, with a minimum of restraint, in a normal, comfortable position. The needle, introduced behind the heart, is attached to a syringe with two-way valve and plastic tubing to carry off the fluid.

Emphysema or mild bronchiectasis occurs occasionally in old cats that are healthy but do much coughing at times and over a period of years. Thickening of the bronchi and decreased pulmonary density are the only radiographic findings.

Primary lung tumors are rare and may be difficult to diagnose. Bronchogenic carcinomas are accompanied by the emaciation, inappetence, and lethargy seen so frequently in old cats, and may not provoke cough or dyspnea till the last day or two. Radiographically, they appear as dense areas usually near the hilus. Bronchial adenomas are often asymptomatic and may be discovered only at necropsy.

Secondary lung tumors, most often metastatic from mammary carcinoma, make far more spectacular radiographs (fig. 5) but, like primary tumors, may long be asymptomatic. Since mammary tumors in the cat are almost always malignant and have often metastasized by the time they are recognized, the chest should always be x-rayed. (Most suspected mammary abscesses prove to be ulcerated and necrotic adenocarcinomas.)

DISORDERS OF THE CHEST CAVITY

Disorders of the chest cavity are exceedingly important in cats and more frequent than in dogs. Crowding of the lungs, whatever the cause, produces a picture that impresses itself indelibly on the memory after two or three encounters. The cat prefers a sitting or sternal position, breathes with slow, labored, abdominal respirations, and is frequently cyanotic. Gentle handling is essential, as excitement or exertion may lead to death from suffocation.

To temporize with such a cat by substituting an oxygen cage or antibiotic for a diagnosis verges on malpractice. Sometimes immediate tapping provides both a diagnosis and at least temporary relief, but the safest course is first to take a lateral radiograph with the cat standing

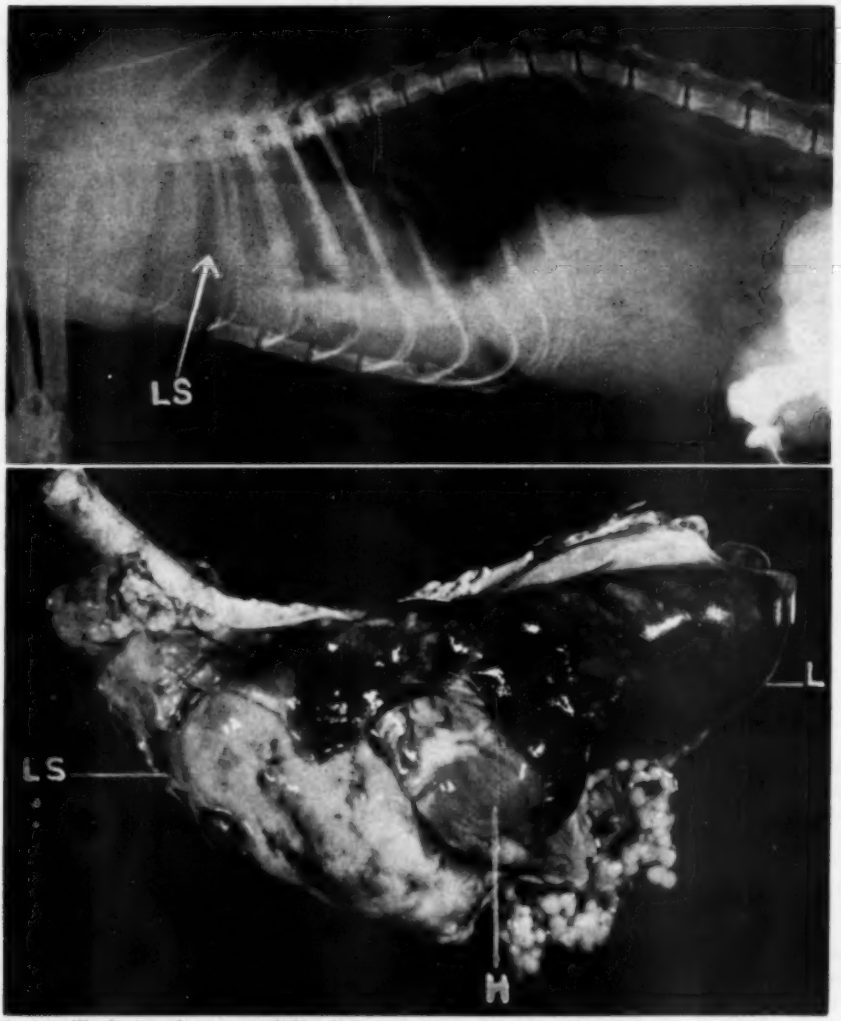

Fig. 9—(Top)—Lymphosarcoma (LS) of the anterior mediastinum. The trachea and esophagus are surrounded, the heart is obscured, and the lungs are crowded back and up. (Bottom)—Lymphosarcoma (LS) of the anterior mediastinum compressing the trachea and displacing the heart (H) and lungs (L).

(fig. 6). This position not only is preferred by the patient but will demonstrate a horizontal "fluid line" in the chest if blood, pus, or transudate is present (fig. 7). Prompt removal of any such fluid (fig. 8) should be followed at once by another radiograph, to discover, if possible, what pathological changes may be responsible for the fluid production. Fluid withdrawn should not be thoughtlessly discarded, since it may be wanted for cellular or bacteriological study.

In a minority of cases, there may have been an injury, and a radiograph or tapping establishes a diagnosis of hemothorax, pneumothorax, chylothorax from a ruptured thoracic duct, or diaphragmatic hernia.

More common in the cat than injuries are disease conditions involving the chest cavity.

The presence of clear transudate suggests a heart abnormality, a tumor, or cirrhosis of the liver. Enlargement of the heart, if due to anemia, is accompanied by pallor or, if due to a structural defect or valvular disease, by abnormal sounds. In hepatic disease there may be liver enlargement, jaundice, and sometimes ascites.

By far the most frequent cause of thoracic transudate in the cat is lymphosarcoma arising in the thymus or mediastinal nodes—a large mass crowding the trachea and esophagus upward, surrounding the heart, and forcing the lungs back and up (fig. 9). Weight loss, dysphagia, cough, and sometimes palpable tumorous involvement of kidneys, of intestine, or of one or several lymph nodes are signs of this condition. It affects cats of all ages, even as young as 6 months, and in its signs it frequently simulates diaphragmatic hernia or empyema. Wright-stained sediment from centrifuged chest fluid may show immature lymphoid cells. Only rarely does a differential blood count disclose a lymphocytosis. Occasionally an exploratory laparotomy is required for differential diagnosis, since a diaphragmatic hernia with a liver lobe incarcerated in the chest may also result in transudate and chest shadows that are difficult to distinguish from those of tumor.

Pyothorax is another "specialty" of the cat. In addition to the information to be gained from a lateral radiograph taken with the cat standing, a dorsoventral view is helpful in determining whether the condition involves one or both sides. If the diagnosis is made by thoracentesis, both sides of the chest should be tapped, since fibrinous deposits on the mediastinum may prevent movement of pus from one side to to other or even limit the infection entirely to one side. Although there may be a history of pneumonitis, a bite wound, or mouth disease, there is often no accounting for the presence of the infection, and an unobservant owner may notice nothing until the sudden development of agonizing dyspnea. Others may report inappetence, thirst, and cough of several days' duration. Terminally, the temperature is normal or subnormal; a fever is a slightly more favorable sign. Culturing has incriminated a variety of organisms, and Gram's stains and darkfield examinations often show mixed infections. Bacteria encountered most frequently are *Escherichia coli*, Pseudomonas, streptococci, and staphylococci. Flocculent pus plugging the aspirating needle may indicate an *Actinomyces necrophorus* infection. Spirochetal infections, present in a minority of cases, are characterized by a thin, pinkish tan pus with a typically foul "trench-mouth" odor, and by high mortality.

If an owner can bear the cost of intensive and prolonged treatment, the most effective measures are oxygen for a day or two, and daily tapping and intrathoracic injection of a proteolytic enzyme to liquefy the pus. In cats in which the pus is too thick or flocculent to be aspirated, the chest must be trocarized through an intercostal space and a small plastic tube introduced. Provided proper precautions are taken to prevent the aspiration of air, this tube may be left in place to facilitate daily flushing of the chest. Wide-range antibiotics should be started at once both systemically and intrathoracically, but the pus should be tested for antibiotic sensitivity to determine which drug will ultimately be selected.

In some cats, pleural adhesions with foci of infection result in relapses. Or the lungs themselves may become involved with a progressive interstitial pneumonia. Still, with a vigorous regimen combining local and systemic treatment, an occasional cat recovers and serves as a reminder that pyothorax is not invariably hopeless.

Feeding Infant Animals

In sow's milk, the protein content of colostrum is high (associated with antibodies), then it falls. The calcium-phosphorus ratio also drops from 1:2 in colostrum to 1:0.6 in normal milk. The nursing pig takes about 1.5 lb. of liquid milk per day during the first week, 2.4 lb. a day during the third to fifth week, and 1.7 lb. a day during the eighth week. It requires about 0.8 lb. of dry milk solids to produce 1.0 lb. of body weight. Pigs can be weaned at birth but, since they get their antibodies through the colostrum, it is better to allow them to nurse for two days.

Pigs, until about a week to ten days old, are unable to digest starch or sucrose, or any protein except casein. After 10 days old, they do well on a dry meal diet. The optimum fat content of such a diet is about 8 per cent; the protein content 25 per cent, decreasing to 18 per cent when the pig weighs 25 lb. After 10 days of age, the pig can digest starch and sugars but their ability to utilize lactose declines.

Calves should be given colostrum for at least 24 hours, and preferably for four days, since they acquire all antibodies from this source. Until the rumen develops, calves seem to be unable to utilize any carbohydrate except lactose or glucose and not more than a total of 250 Gm. of these per day. The rate of rumen development depends on the amount of roughage fed.—*Nature (Oct. 5, 1957)*: *682.*

Colostrum vs. Antibiotics for Calves.—When colostrum was fed to Jersey calves for the first four days, then whole milk through day 21, and skim milk until the calves were 60 days old, they gained 41 lb. When colostrum was continued in the diet for 21 days, comparable calves gained 51 lb. in 60 days. The addition of wide-spectrum antibiotics or other antibacterial drugs stimulated growth in the first group but had little effect on the latter group. Orotic acid, a normal constituent of milk, is a growth stimulant.—*Hoard's Dairyman (Nov. 25, 1957): 1140.*

Effect of Gestation Diet on Pig Growth.—The survival rate of pigs, at 56 days of age, in an experiment at Beltsville, Md., was significantly greater when the mothers had been fed a ration containing 17.5 to 20.0 per cent of protein than on a controlled diet of 15 per cent protein. The addition of antibiotics and vitamin B_{12} to the sows' gestation diet did not significantly affect the pigs' survival but, when added to the pigs' diet, did increase their growth rate.—*J. Anim. Sci. (Nov., 1957): 877.*

Nutrition After Surgery

When the surgical patient can not or will not take food, and nutrition is given intravenously, the solution should contain nitrogen, essential electrolytes, and vitamins. A solution of protein hydrolysates, containing 10 per cent hexose, will contain 12 Gm. of nitrogen and 1,100 calories in 2 liters of fluid. It will also provide potassium as well as sodium and chloride.

To provide 20 calories per pound of weight by intravenous feeding, it would require giving hypertonic sugar solution (25 to 50%), alcohol, or fat emulsions. Vitamins can be added to the solution—20.0 mg. of niacin, 7.5 mg. of riboflavin, and 5.0 mg. of thiamine being recommended daily for a man of average size. The nitrogen deficiency in male patients has been greatly reduced by giving 200 to 250 mg. of testosterone cyclopentylpropionate prior to surgery.—*J.Am.M.A. (Dec. 7, 1957): 1830.*

The Estrogenicity of Alfalfa.—The assay of 56 strains of several varieties of alfalfa, at Purdue University, indicated a wide variation in their estrogenic activity, as measured by the weight of the uterus in ovariectomized mice. The percentage of the uterine weight to the total body weight varied from 0.071 to 0.336 in the alfalfa-fed mice compared with 0.068 per cent in control mice. In a second experiment to show the comparative effect when diethylstilbestrol was added to a nonalfalfa ration, the percentage of uterine weight to total body weight was 0.155 with a dose of 0.01 μg. of the hormone per gram of feed, and was 0.554 with 0.32 μg. per gram of feed.—*J. Anim. Sci. (Nov., 1957): 850.*

Hygromycin A Aids Digestion in Lambs.—In a 45-day feeding trial with 40 wether lambs, at the University of Kentucky, hygromycin A (5 mg./lb. of feed), added to the basal ration, resulted in a significant increase in gain and feeding efficiency.—*J. Anim. Sci. (Nov., 1957): 1035.*

Editorial

Veterinarians in Film and Fiction

As the public becomes more aware of the services rendered by the veterinary profession, it is natural for authors and script writers to introduce the veterinarian as a character in their story material. Also, because of the economic importance of livestock diseases, many stories using this subject as a background will appear on film or in print.

The immediate reaction among the profession to such a development is favorable and we are inclined to say "It's about time our group received some recognition." We naturally assume that the veterinarian will be cast as the hero and that the portrayal by the actor will be accurate and favorable to us as veterinarians.

A number of stories and films have been produced that are quite acceptable. But what about those that do not present veterinarians as we would desire, or those that are definitely in poor taste?

The problem is to distinguish between legitimate complaints and protestations that seem absurd. For instance, there were complaints when, in the "Broken Arrow," an army doctor was called to diagnose foot-and-mouth disease in Apache cattle in 1870. Should we expect the professional decorum of a 1958 veterinarian to be shown in a sequence depicting conditions of 1870?

"The Scared Comedians," an article in the September, 1957, issue of the *Public Relations Journal*, discussed such problems. Radio and television actors (particularly comedians), advertising agencies, stations, sponsors, and writers have all been subjected to the wrath of organized groups objecting to the manner in which they have been portrayed.

Good Public Relations

Many local associations have established fine working relationships with press, radio, and television in an effort to obtain favorable publicity for veterinary medicine in mass communication media. Those who have taken a realistic attitude have had the greatest success.

While we may be disturbed by some of these portrayals, we must remember that the daily impression an individual leaves with his clients, his public, and his neighbors has an infinitely greater and more lasting effect on the opinion which the public has of veterinary medicine than does any series of pictures or articles, which has only a passing effect on the viewing or reading audience.

Inaccuracy for Art's Sake

The basis of criticism of public portrayals of scientific subjects is often the seeming clash between artistry and accuracy. It may be necessary to tolerate inaccuracy to attract an "audience" but is it needed for professional readers?

One of the frustrating problems of an editorial staff is preventing the introduction and perpetuation of inaccurate or semiaccurate terms. Many such occur when authors refer to the anatomy of even the most common species of animals.

The effect of de-emphasizing anatomy is noticeable in many manuscripts. This would seem to make it the more urgent to have published anatomical sketches (or descriptions) as accurate as possible, with correct labeling. Therefore, we notice with concern, in a veterinary house organ (*Jen-Sal J.*, Dec., 1957), a nicely prepared sketch of a superficial dissection of a horse but with labels purportedly showing the location of some "common" and some strange "lamenesses" in very strange places.

For instance, a "splint" is indicated as occurring at the middle of the volar surface of the carpus; a "thoroughpin" is located on the tuber calis; a bone spavin on the dorsolateral surface of the hock, a "jack spavin" (presumably a lesion other than a bone spavin) at the level of the tibiotarsal articulation, and a "bog spavin" on the lateral surface of the proximal extremity of the metatarsal region.

Publishing such inaccuracies may induce one who knows the horse only to raise an eyebrow, but it may be a distinct disservice to many younger members of the profession who know little about the anatomy and unsoundness of the horse. One can only hope that those who notice the sketch will recognize that it was doubtless prepared for its artistic effect while scorning accuracy, a type of artistry we can well dispense with.

ABSTRACTS

Vesicular Stomatitis Virus in Cattle

Vesicular stomatitis (VE) infection of bovine epithelium is manifested, initially, by changes in the stratum spinosum, later extending to the basal layer and stratum granulosum. The virus effect begins as a contraction of the cytoplasm of infected cells concomitantly with increased prominence of the intercellular bridges. Cytoplasmic shrinkage continues until the cell consists of an apparently unaltered nucleus surrounded by a thin rim of cytoplasm. Nuclear pyknosis then occurs, and the cell floats freely in the accumulated vesicle fluid. Classic hydropic degeneration does not occur.

Studies of cultures of infected bovine skin revealed that release of virus from infected cells began about the third hour after infection.

In phase microscope studies of infected bovine skin in tissue culture, basically the same changes were seen as in the infected host. About two hours after infection, before virus liberation could be detected, contraction of cytoplasm was seen, along with continued extension of the cytoplasmic processes. By the fourth hour, the filamentous mitochondria had developed globular swellings. Cytoplasmic contraction continued and, by the sixth hour, mitochondria were no longer detectable. The nucleus then began to shrink, although at a slower rate than did the cytoplasm. The process was complete by the tenth to twelfth hours, at which time the cell floated free as a small, spherical mass of granular cytoplasm enclosing a minute, shrunken residual nucleus. The viability of VE-infected bovine epithelial cells is, therefore, considered to be less than 12 hours.—[*William E. Ribelin: The Cytopathogenesis of Vesicular Stomatitis Virus Infection in Cattle. Am. J. Vet. Res., 19, (Jan., 1958): 66-73.*]

Piperazine for Parasites of the Horse

Seven critical tests were made with a suspension of piperazine-carbon disulfide complex (Parvex) in horses at dosages of 75, 100, 150, and 200 mg./kg. of body weight. Complete removal of both mature and immature ascarids and nearly complete removal (89 to 98%) of the small strongyles was observed. Large strongyles were less effectively removed (34 to 65% for *Strongylus vulgaris;* 0 to 38% for *Strongylus edentatus*).

The efficacy against bots ranged from 17 to 100 per cent for *Gastrophilus intestinalis* and 63 to 100 per cent for *Gastrophilus nasalis.* Activity against immature pinworms was of a low order (0 to 28%), while limited evidence indicated a more effective action (64 to 75%) against the adult forms. There was no evidence of activity against the stomach worms *Trichostrongylus axei* and *Habronema muscae.*—[*J. H. Drudge, S. E. Leland, Jr., Z. N. Wyant, G. W. Elam, Charles E. Smith, Jr., and Edwin Dale, Jr.: Critical Tests with Piperazine-Carbon Disulfide Complex (Parvex) Against Parasites of the Horse. Am. J. Vet. Res., 18, (Oct. 1957): 792-797.*]

Distribution of Penicillin in Normal Goat Udders

Radioactive penicillin, labeled with isotope S^{35} and prepared both as an aqueous solution and a suspension in oil, has been introduced through the teat canal into normal goat udders. The animals were killed and the udders frozen in acetone-carbon dioxide ice and then sliced into 50-μ sections. The sections were freeze-dried and pressed against x-ray film.

Both the penicillin in oil and the aqueous penicillin showed a fairly uniform distribution and reached all portions of the parenchyma. Penicillin in oil was concentrated more in the dorsal portions of the udders and was found in the milk ducts, rather than in the parenchyma, to a somewhat greater degree than was penicillin in aqueous solution.—[*Sven Ullberg, Eskil Hansson, and Hans Funke: Distribution of Aqueous Penicillin and Penicillin in Oil in Normal Goat Udders Following Intramammary Injection—An Autoradiographic Study. Am. J. Vet. Res., 19, (Jan., 1958): 135-139.*]

Huddleson's Brucella Mucoid Vaccine

Brucella M vaccine was injected subcutaneously into 487 serologically negative cows and heifers, located in 12 privately owned dairy herds, to determine its capability of engendering an active immunity against brucellosis.

In all herds except one, approximately 10 per cent of the negative adult animals were left as unvaccinated controls. Approximately 36.9 per cent of the controls became infected, according to the blood-agglutination titer while, under the same exposure, 23.4 per cent of the Brucella M-vaccinated animals had reactor titers. These differences were more marked when the calvings of these two groups were considered.

The percentage which aborted or had premature calves was approximately 27.4 for the controls, and only 8.8 per cent for the Brucella M-vaccinated animals.—[*N. B. King, B. H. Edgington, and Norma A. Frank: The Use of Huddleson's Brucella M Vaccine Under Field Conditions. Am. J. Vet. Res., 19, (Jan., 1958): 93-96.*]

New Brucella Species Isolated From Desert Wood Rat

Five strains of an organism, for which the name *Brucella neotomae* is proposed, were recovered from *Neotoma lepida* collected in Utah. On primary isolation, these strains grew aerobically without increased CO_2 tension. As determined by cross-absorption tests, the organism is antigenically similar to *Brucella abortus.* Also, colonial and cellular morphology and most of the biochemical properties of *Br. neotomae* are similar to those of the three known species of Brucella. However, the

organisms isolated from *N. lepida* are distinguished from other Brucella, since *Br. neotoma* produces acid without gas in dextrose, levulose, xylose, arabinose, and galactose; it is sensitive to both thionin and basic fuchsin, and it is more infective for mice than for guinea pigs.—[*Herbert G. Stoenner and David B. Lackman: A New Species of Brucella Isolated from the Desert Wood Rat, Neotoma Lepida Thomas. Am. J. Vet. Res., 18, (Oct., 1957): 947-951.*]

Chemotherapeutic Trials Against Trichomonas

Twenty-nine drugs were tested topically, systemically, or by both methods, against *Trichomonas foetus* in 629 vaginally infected hamsters. One drug, aminitrozole, showed promise of systemic influence on the infection. The experience, in general, was such as to indicate the usefulness of the infected female hamster for screening drugs of potential value in *T. foetus* infections.—[*Robert Rubin and D. R. Corday: A New Approach in Chemotherapeutic Trials Against Trichomonas Infections. Am. J. Vet. Res., 19, (Jan., 1958): 249-251.*]

Extenders for Ram Semen

A study was made to compare reconstituted skimmed milks with egg yolk-sodium citrate as extenders for ram semen. Semen was collected from 4 yearling Suffolk rams and maintained in the extenders at 38 F. for periods up to 15 days. Data showed that the reconstituted skimmed milks compared favorably with egg yolk-sodium citrate as extenders for ram semen.—[*J. R. Hill, Victor Hurst, and W. C. Godley: A Comparison of Reconstituted Skim Milk and Egg Yolk-Sodium Citrate as Extenders for Ram Semen. Am. J. Vet. Res., 19, (Jan., 1958): 129-131.*]

Isopropyl Alcohol in Frozen Semen

Ten samples of frozen semen, stored in 2-cc. heat-sealed polyethylene ampules and immersed in an isopropyl alcohol bath at −79 C. for eight months to two years, were quantitatively examined for the presence of isopropyl alcohol in the semen. No alcohol was detected in the semen by the method used.—[*Phillip W. Murdick: The Detection of Isopropyl Alcohol in Frozen Semen. Am. J. Vet. Res., 19, (Jan., 1958): 247-248.*]

Tests for Ornithosis Antibodies in Turkey Serums

The results of testing serum samples from 923 turkeys for ornithosis antibodies by (1) the indirect complement-fixation test, (2) direct complement-fixation test using detergent-extracted antigen, and (3) a macroscopic agglutination test were compared. There was a correlation of 42.3 per cent between the results of the agglutination test and indirect-complement fixation test, 40.4 per cent agreement between results of the agglutination test and the direct complement-fixation test, and 85.1 per cent agreement between the results of the indirect complement-fixation test and the direct complement-fixation test.—[*James E. Neal and D. E. Davis: A Comparison of the Indirect Complement-Fixation Test, the Direct Complement-Fixation Test, and the Macroscopic-Agglutination Test for Ornithosis Antibodies in Turkey Serums. Am. J. Vet. Res., 19, (Jan., 1958): 200-203.*]

BOOKS AND REPORTS

Minerals in Pasture

The author states, "This book represents an attempt to survey relevant work in as many countries as possible, and to show local variations in conditions . . . The study of nutritional and metabolic disorders in grazing animals must be of economic importance in every country in the world."

The diagnosis of mineral deficiencies in animals is often dependent upon symptoms, history, incidence in certain geographical areas, and the results of feeding tests supported by blood and tissue examinations.

Of its 170 pages, the book devotes 132 pages to a discussion of cobalt and copper. The other minerals mentioned are sodium, calcium, chlorine, potassium, molybdenum, selenium, phosphorus, and iodine.

Many names, varying with the country in which they occur, are given to diseases caused by mineral deficiencies. The book lists 25 names, 14 of which pertain to cobalt deficiency.

A complete summary is given in a table showing the name of the disease, species affected, country, principal areas investigated, principal soils, character of pasture, effect of fertilizers, incidence of disease, blood and tissue findings, response to feeding tests, and conclusions.—[*Minerals in Pasture: Deficiencies and Excesses in Relation to Animal Health. By F. C. Russel and Dorothy L. Duncan. Commonwealth of Animal Nutrition, Rowett Institute, Bucksburn, Aberdeenshire, Scotland. 1957. Price not given.*]—H. E. KINGMAN, SR.

Viruses in Man and Animals

This German translation of a Russian text discusses the evolution of viruses and their classification, as well as the virus diseases of man and animals. The scope is limited, and only a few references are cited.—[*W. M. Shdanow: Viruses in Man and Animals. 279 pages. Illustrated. Gustav Fischer, Jena, Germany, 1957. Price D.M. 23.50 (approx. $6.00).*]—F. KRAL.

The Physician's Own Library

A librarian discusses the need of any physician for a private library and outlines the procedures by which it can be assembled efficiently.—[*The Physician's Own Library. By Margaret Louise Marshall. 87 pages. Charles C Thomas, 301-327 E. Lawrence Ave., Springfield, Ill. 1957. Price $3.00.*]

THE NEWS

U.S. Livestock Sanitary Association Has Sixty-First Meeting in St. Louis

The U.S. Livestock Sanitary Association held its sixty-first annual meeting at the Chase-Park Plaza Hotel in St. Louis, Mo., Nov. 13-15, 1957.

The 21 committees of the association presented their reports at various times throughout the three-day meeting. Among the chairmen reporting on the activities of their respective committees were: Drs. V. D. Chadwick, Jackson, Miss.—Rabies; J. G. Milligan, Montgomery, Ala.—Nationwide Eradication of Hog Cholera; S. F. Scheidy, Philadelphia—Biological and Pharmaceutical Products; Glen B. Rae, Pierre, S. Dak.—Tuberculosis; and R. W. Smith, Concord, N. H.—Brucellosis.

Among the veterinarians who appeared on the program, and their subjects, were: J. A. Baker, Ithaca, N. Y.—Combination Vaccines; W. R. Pritchard, Gainesville, Fla.—Infectious Ulcerative Stomatitis of Cattle; A. W. Lindquist, Beltsville, Md.—Systemic Insecticides for Control of Cattle Grubs and Other Livestock Insects; and A. F. Ranney, Washington, D. C.—State-Federal Cooperative Tuberculosis Eradication Program.

Dr. M. G. Fincher, Ithaca, N. Y., moderated a panel discussion on mastitis in which Drs. C. D. Van Houweling, J. M. Murphy, W. D. Pounden, and O. W. Schalm participated.

Training in Veterinary Mycology

A course in Laboratory Diagnostic Methods in Veterinary Mycology will be offered at the Communicable Disease Center, Public Health Service, Chamblee, Ga., Feb. 24-28, 1958.

This course is designed to familiarize veterinarians, laboratory workers, and others concerned with the procedures for detecting, isolating, and identifying the fungi which causes mycotic infections in animals. The etiological agents are studied in tissue and in culture.

The methods of diagnoses covering specimen collection, culture mediums, laboratory animal inoculations, and other procedures are taught, used, and demonstrated. The symptomatology, epizootiology, and public health importance of the individual mycoses are also stressed.

Additional information and application forms may be obtained from: Laboratory Training Services, Communicable Disease Center, P.O. Box 185, Chamblee, Ga.

Veterinarian Wins $32,000.—Dr. Alexander Sas Jaworsky, Abbeville, La., won $32,000 on the "$64,000 Question" on January 14. His category is American history.

AMONG THE STATES AND PROVINCES

Arizona

State Association.—The Arizona V.M.A. held its annual meeting on Dec. 1-3, 1957, at the Hiway House Motor Hotel in Phoenix. Veterinarians from Arizona and the neighboring states attended the meeting.

The speakers on the program included: Drs. William C. Banks, Texas A. & M. College; Russell J. Beamer, Texas A. & M. College; Timothy H. Brasmer, Danville, Ill.; Duane L. Cady, El Paso, Texas; W. Bruce Farquharson, Phoenix, Richard E. Hoadley, Coachella, Calif.; Roger V. Jessup, Glendale, Calif., Donald Miller, Phoenix; and Raymond E. Reed, University of Arizona, Tucson.

During the banquet, Dr. Jack A. King (COL '38), Phoenix, was announced as the recipient of the second annual "Outstanding Veterinarian of the Year" award. Dr. King is a Lt. Colonel in the U.S. Army Reserve; he was state veterinarian in Arizona from 1953-1957.

The following veterinarians were elected to hold office in the association for the coming year: Drs. B. C. Ham, Yuma, president; R. E. Reed, Tucson, president-elect; J. P. Fuller, Phoenix, secretary-treasurer. Dr. D. E. Monty, Scottsdale, will be resident-secretary for the next two years.

s/D. E. MONTY, JR., *Resident-Secretary.*

Illinois

Eastern Illinois Association.—The Eastern Illinois V.M.A. held its winter meeting at the Hotel Tilden Hall in Champaign on Dec. 5, 1957.

During the business meeting, the following officers were elected to serve the association for the ensuing year: Drs. R. W. Abell, Chrisman, president; E. E. Lutz, Champaign, president-elect; and A. G. Schiller, Champaign, secretary-treasurer.

s/LYLE E. HANSON, *Secretary-Treasurer.*

Iowa

Interim Group, ARS, at Iowa State.—The Agricultural Research Service, U.S.D.A., has established in the new diagnostic laboratory, at Iowa State College, an Interim Group to work on diagnostic problems for the animal disease eradication division. This will continue until the Federal Animal Disease Research Center, to be built near Ames, is completed. Construction is expected to start by summer.

Kansas

State Association.—The fifty-fourth annual convention of the Kansas V.M.A. was held at the Hotel Broadview, in Wichita, Jan. 12-14, 1958.

On the second day of the convention, Mr. Lloyd Larson, executive vice-president, Midwest Feed Manufacturers Association, discussed the veterinarian's relationship to livestock feeds, and Mr. Brian Forster, director of public information, AVMA, spoke on "Veterinary Public Relations Requires Teamwork."

Among the veterinarians and their respective subjects also included on the convention program were: Drs. W. T. S. Thorp, dean, College of Veterinary Medicine, University of Minnesota—Diseases of Animals Transmissible to Man; G. J. MacLean, veterinary field representative, Allied Laboratories, Inc.—Feedlot Diseases; F. W. Cutlip, general practitioner—Management and Therapy of the Young Calf; R. J. Beamer, small animal clinician, A. & M. College of Texas—Surgery in Feline Practice (film); J. O. Knowles, small animal practitioner, Miami, Fla.—Basic Immunology and Related Allergic Phenomena.

Missouri

Greater St. Louis V.M.A. Honors Twelve Veterinarians.—Twelve veterinarians who have served their community for 45 years or more were honored at a special dinner dance meeting of the Greater St. Louis V.M.A. in the Crystal Room of the Coronado Hotel, Dec. 6, 1957.

Among the veterinarians honored are: Drs. C. F. W. Bauer (OSU '04), Florissant; George W. Leber (CVC '09), Pacific; O. T. Murphy (KCV '10), Kirkwood; H. J. Schlesinger (CVC '10), New Athens, Ill.; L. J. Miller (MCK '10), Waterloo, Ill.; W. G. Teckenbrock (CVC '10), East St. Louis, Ill.; R. R. Downing (TH '12), East St. Louis; and Joseph Emonts (KCV '08), St. Charles.

Other guests of honor included Mr. J. H. Williamson, state commissioner of agriculture; Dr. L. A. Rosner, state veterinarian; Dean A. H. Groth, School of Veterinary Medicine, University of Missouri: and Dr. J. K. Farrell, president, Missouri V.M.A.

Montana

Dr. Dale Suplee Named Veterinarian in Charge of U.S.D.A., Regulatory Activities in Montana.—The appointment of Dr. Dale Suplee (KSC '31) as veterinarian in charge of the U.S.D.A., Agricultural Research Service regulatory activities in Montana became effective Dec. 1, 1957.

Prior to this assignment, he was assistant veterinarian in charge of animal disease eradication in the State of Washington.

Dr. Suplee entered the federal service in Texas, in 1934, with the tuberculosis eradication division of the Bureau of Animal Industry. He fills the vacancy created by the transfer of Dr. John L. Wilbur, Jr., as veterinarian in charge of regulatory activities in Texas.

New Jersey

Metropolitan Association.—The Metropolitan New Jersey V.M.A. will hold its regular, monthly meeting on Feb. 19, 1958, at the Academy of Medicine Building, Newark.

Dr. Mark L. Morris, consultant in small animal nutrition, Topeka, Kan., will address the association on "Small Animal Nutrition."

s/M. S. ARLEIN, *Secretary-Treasurer.*

New York

Wanted: Executive Secretary for the New York V. M. S.—At the sixty-sixth annual meeting of the New York State Veterinary Medical Society in September, 1957, the membership voted to employ a full-time executive secretary. The society is now looking for applications from interested parties.

The applicant is expected to be a person of demonstrated integrity and character, with a good basic education, preferably a college degree. He need not be a veterinarian, although a knowledge of the problems of the profession or the ability to acquire such knowledge would be necessary.

The applicant should give evidence of ability to deal with members of the legislature and state officials. He should be a good business manager and willing to assume primary responsibility for a diversity of duties which will advance the interests of the society, and he should be willing to live in close proximity to the central office of the society, but also willing to do considerable traveling throughout the state.

Applications containing complete details, experience, and qualifications, must be sent to the secretary of the Executive Secretary Procurement Committee not later than March 1, 1958; Dr. W. A. Hagan, New York State Veterinary Medical Society, 803 Varick St., Utica, N.Y.

North Carolina

Eastern North Carolina Association.—The regular, monthly meeting of the North Carolina V.M.A. was held at Parker's Barbeque Restaurant in Wilson on Dec. 6, 1957.

At the business meeting, the following veterinarians were elected for the coming year: Drs. Bruce H. Staton, Rocky Mount, president; William A. Potts, Mount Olive, vice-president; and Bryon H. Brow, Goldsboro, secretary-treasurer.

The association announced that a clinic will be held in the near future in conjunction with a regularly scheduled meeting.

s/BRYON H. BROW, *Secretary-Treasurer.*

North Dakota

North Dakota Agricultural College Offers Annual Veterinary Short Course.—The annual veterinary short course will be held at the Van Es Laboratory at the North Dakota Agricultural College, Feb. 13-14, 1958.

The post mortem diagnosis of large animals and poultry will be stressed and the diagnosis and control of leptospirosis will be well covered. The discussions and demonstrations will begin at 10:00 a.m. on February 13.

If you plan to attend the Short Course, please notify Dr. Donald F. Eveleth, head, Veterinary Science Department, N.D.A.C., State College Station, Fargo, N. Dak.

Pennsylvania

Annual Conference of Veterinarians.—The fifty-eighth annual conference of veterinarians was held at the University of Pennsylvania, in Philadelphia, Jan. 7-8, 1958.

Some of the speakers and their subjects on the conference program were: Drs. P. P. Levine, N. Y.—Avian Pathology Comes of Age; J. C. Holzworth, Mass.—Disease Conditions Prominent in Cats; C. W. Raker, Pa.—Surgical Management of Chip Fractures of the Equine Carpus, Fetlock and Sesamoid; C. L. Blakely, Mass.—Maintenance of Respiration During Chest Surgery; W. P. Switzer, Iowa—New Developments in our Knowledge of Respiratory Diseases of Swine; and K. Hubben, Pa.—Systemic Fungus Diseases.

Dr. A. H. Frank, Md., discussed "Infectious Causes of Sterility in Dairy Cattle" at the conference dinner sponsored by the Veterinary Medical Alumni Society on January 7.

Texas

Dr. Wilbur Veterinarian in Charge of U.S.D.A., Animal Disease Eradication and Inspection in Texas.—Dr. John L. Wilbur, Jr. (WSC '40), was appointed veterinarian in charge of the U.S.D.A.'s Agricultural Research Service regulatory activities in Texas, Dec. 1, 1957.

He was formerly veterinarian in charge of animal disease eradication in Montana. He entered U.S.D.A. service after graduation, serving in Idaho and Nebraska.

Dr. Wilbur fills the vacancy created by the retirement of Dr. F. L. Herchenroeder.

STATE BOARD EXAMINATIONS

NEW YORK—June 18, 19, 1958, practical examination, Ithaca; June 24-27, 1958, written examination, New York City, Albany, Syracuse, Buffalo, and Rochester. John W. Paige, chief, Bureau of Examinations and Registrations, 23 S. Pearl St., Albany, N.Y.

NORTH DAKOTA—April 9-10, 1958, Fargo. M. C. Hawn, secretary-treasurer, 1407 13 St. N., Fargo, N. Dak.

DEATHS

Star indicates member of AVMA

★**Redding S. Sugg** (API '15), 64, dean of the School of Veterinary Medicine, Alabama Polytechnic Institute, since 1940, and a member of the AVMA Executive Board since 1949, died on January 4, 1958, following a cerebral hemorrhage suffered a few days previously.

Born at Old Sparta, N. Car., on Oct. 19, 1893, Dr. Sugg received his early education in the local schools and then attended North Carolina State College at Raleigh for three years before transferring to Alabama Polytechnic Institute in the fall of 1913, where he completed requirements for

Dr. Redding S. Sugg

the B.S. degree in animal husbandry in 1914 and the D.V.M. degree in 1915.

Dr. Sugg returned to North Carolina and practiced for about a year before returning to his alma mater where he was successively an instructor in veterinary bacteriology and pathology, assistant professor of bacteriology, and then professor. From 1928 to 1930, and again from 1931 to 1940, he served as extension animal husbandman for the Alabama agricultural extension service.

In 1940, Dr. Sugg was appointed state veterinarian and dean of the School of Veterinary Medicine. It was in the latter capacity that he began his untiring and successful work in behalf of regional education in the southern states; the groundwork for this program was laid in 1947, and largely due to his efforts, an agreement was reached by the governors of several southeastern states for regional education in medicine, veterinary medicine, and dentistry. This achievement set the pattern for other regional education developments.

Since 1951, he had served full-time as dean. Interspersed in this busy professional career

was active service in the Army Veterinary Corps in both World Wars. In 1917, Dr. Sugg was commissioned second lieutenant in the Regular Army and was discharged with the rank of captain in 1919, after duty with the auxiliary remount depots at Camp Beauregard, La., and Camp Funston, Kan. As a reserve veterinary corps officer, he was recalled to active duty in 1942 as a lieutenant colonel and served as chief of the Veterinary Service Branch at Camp Shelby, Miss., until 1946, since which time he was a colonel in the Veterinary Reserve Corps.

Dr. Sugg was always active in other professional affairs and received numerous honors from his colleagues for his work in their behalf, including the presidency of the Alabama V.M.A. and the Southern V.M.A. In 1951, he was awarded the Twelfth International Veterinary Congress Prize by the AVMA in recognition of his contributions to regional veterinary education. He was a member of Alpha Psi, Epsilon Sigma Phi, Phi Kappa Phi, and Phi Zeta fraternities, the Masons, and Kiwanis.

At the fiftieth annual veterinary conference at A.P.I. last July, a portrait of Dean Sugg was presented to the school by the veterinary faculty in appreciation of his work and achievements.

Surviving are his widow, the former Katherine Maude Miller, one son, Redding S. Sugg, Jr., and one sister.

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Walter S. Grogan (ONT '14), 71, Winnipeg, Ont., died Nov. 15, 1957.

Dr. Grogan had practiced in Reston and other Manitoba sections for several years before joining the Health of Animals, Inspection Service Branch, at Winnipeg. He had retired from the practice of veterinary medicine in 1954. Dr. Grogan was a member of the Masonic Lodge, Orange Lodge, and Canadian Legion.

He is survived by his wife, Mrs. Jennie Grogan, and two sons.

John E. Hann (KCV '11), 66, Neosho, Mo., died Nov. 3, 1957, as a result of a heart attack.

Dr. Hann had practiced veterinary medicine in Kansas and Missouri throughout most of his life. He is survived by his widow, Mabel Hann, a daughter, and two sisters.

★**Charles G. Jennings** (CVC '01), 85, Morris, Minn., died Oct. 11, 1957.

Dr. Jennings had been a practicing veterinarian in Morris for half a century until failing health dictated his retirement in 1953.

He is survived by his widow, Elma Nilson Jennings, a son, and a daughter.

★**Carleton G. Libby** (KSC '18), 63, Gulfport, Miss., died Nov. 25, 1957, at the Veterans Hospital in Jackson, Miss.

Dr. Libby had served with the U.S. Army during World War I. He joined the Department of Agriculture in August, 1934, serving with the Bureau of Animal Industry in Topeka, Kan. After his transfer to Louisiana in April, 1935, Dr. Libby served throughout the state on various eradication projects.

Immediately prior to his retirement, due to illness, in February, 1956, Dr. Libby served as area veterinarian for East Baton Rouge, East and West Feliciana, and St. Helena, with responsibility for the control and eradication of livestock diseases, particularly those of brucellosis and tuberculosis.

Dr. Libby was president of the Louisiana V.M.A. in 1946, and was active in the association until the time of his illness. He is survived by his wife, Dorothy Norris Libby, and his two daughters.

★**William J. Moslander** (MCK '19), 63, Grand Island, Neb., died Oct. 29, 1957, following a heart attack.

After graduation, Dr. Moslander returned to Grand Island and practiced veterinary medicine in association with Dr. A. A. Andersen, later forming a partnership with Dr. M. Latham. Following Dr. Latham's retirement, the Grand Island Veterinary Hospital, Inc., was formed with Dr. Moslander as president. He had also been a member and past-president of the Nebraska V.M.A.

Dr. Moslander is survived by his wife, Irene Huet Moslander, and three daughters.

John W. Oosting (GR '16), 72, Fremont, Mich., died Oct. 10, 1957, in Gerber Memorial Hospital, after a long illness. Dr. Oosting had practiced veterinary medicine in Fremont for 41 years.

He is survived by three sons, three daughters, and a brother.

Joseph T. Quarll (UP '04), 76, Avondale, Pa., died Nov. 4, 1957, at Elsmere Veterans Hospital, Del., after a brief illness.

During World War I, Dr. Quarll served as a lieutenant in the Veterinary Corps of the U.S. Army. Following his discharge, he practiced in Avondale until his death.

He is survived by his wife, Sara McCann Quarll, and a stepson.

★**Don R. Wilson, Sr.**, (KCV '16), 63, formerly of Dothan, Ala., died Oct. 31, 1957, in a San Antonio, Texas, hospital as a result of pneumonia.

Dr. Wilson was with the U.S. government and was assigned to Sunnyland Packing Company, while residing in Dothan for 11 years, previous to his transfer in September, 1957, to San Antonio.

He is survived by his wife, Myrtle Miller Wilson, a son, and a daughter.

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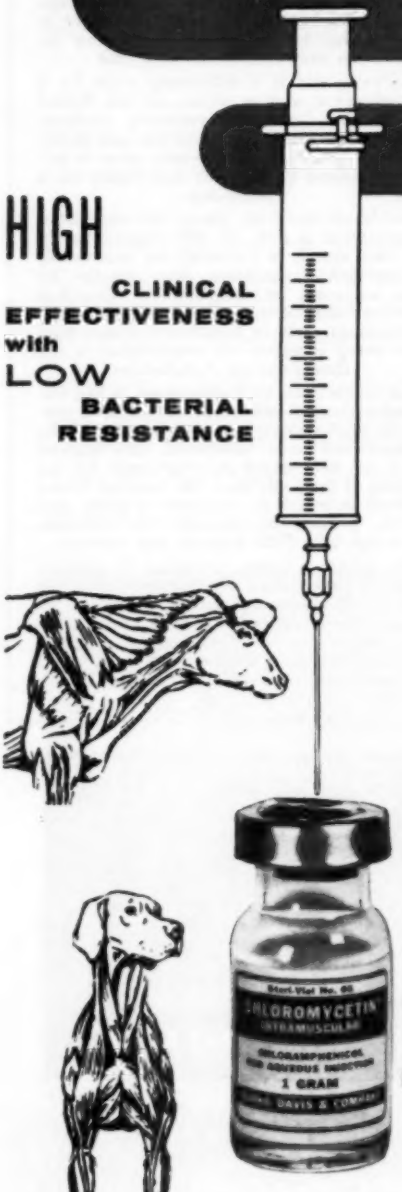

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APPLICATIONS

Applicants—Members of Constituent Associations

In accordance with paragraph (e) of Section 2, Article X, of the Administrative Bylaws, as revised at the annual meeting of the House of Representatives, Aug. 18, 1951, in Milwaukee, Wis., the names of applicants residing within the jurisdictional limits of the constituent associations shall be published once in the JOURNAL.

The following applicants have been certified as members of the constituent association that has jurisdiction over the area in which the applicant resides. This certification was made by the secretary of the constituent association in accordance with paragraph (c) Section 2, Article X, of the Administrative Bylaws.

First Listing

BENSON, THOMAS L.
7327 Long Dr., Houston, Texas.
D.V.M., A. & M. College of Texas, 1953.

BRYSON, HENRY LEWIS
City Hall, Health Dept., Vancouver, B.C.
D.V.M., Ontario Veterinary College, 1941.

FULLER, GEORGE B.
1602 3rd Ave., Scottsbluff 2, Neb.,
D.V.M., Colorado State University, 1932.

KROTH, ROY M.
27120 Harper Ave., St. Clair Shores, Mich.
D.V.M., Michigan State University, 1945.

LUNDBERG, RAYMOND W.
2810 S. Federal Hwy., Fort Lauderdale, Fla.
V.M.D., University of Pennsylvania, 1956.

McENROE, KENNETH M.
1000 West 31st, Waco, Texas.
D.V.M., A. & M. College of Texas, 1948.

MAYNE, ROBERT FREDERICK
R. R. 1, Loogootee, Ind.
D.V.M., Michigan State University, 1943.

NURSE, WILLIAM H.
15797 Mack Ave., Detroit, Mich.
D.V.M., Ontario Veterinary College, 1950.

PLUMMER, P. J. G.
Animal Disease Research Institute, 100 Gamelin Blvd., Hull, Que.
D.V.M., Ontario Veterinary College, 1928.

VOGEL, ALLEN A.
185 Locust St., Northampton, Mass.
D.V.M., New York State Veterinary College, 1940.

Applicants — Not Members of Constituent Associations

In accordance with paragraph (e) of Section 2, Article X, of the Administrative Bylaws, as revised at the annual meeting of the House of Representatives, Aug. 18, 1951, in Milwaukee, Wis., notice of all applications from applicants residing outside of the jurisdictional limits of the constituent associations, and members of the Armed Forces, shall be published in the JOURNAL for two successive months. The first notice shall give the applicant's full name, school, and year of graduation, post office address, and names of his endorsers.

Second Listing

RYAN, ROBERT P., 3018 Oakland Blvd., N.W., Roanoke, Va.

AVMA Research Fellowships Available

The Research Council of the AVMA announces the availability of a number of fellowships for postgraduate training for the academic year, 1958-1959.

The recipient of a fellowship must be a veterinarian and a citizen of the United States or Canada. Veterinary students who expect to graduate at the end of the current school year and who wish to follow a career in research may apply for a fellowship.

The latest date for filing the completed application is Feb. 15, 1958. Approximately one month is required for processing completed applications after receipt by the secretary of the Council. Qualified persons should secure and submit applications as early as possible to insure their file being complete for presentation to the Committee on Fellowships.

The Committee on Fellowships of the Research Council will meet in March to consider applications, and the awards will be announced soon afterward. The stipend will be determined in each case by the needs of the individual, the location of the school in which he proposes to work, and other factors. In general, the stipends range from $100 monthly and upward.

Any qualified person interested in graduate training may obtain application blanks and other information by writing to Dr. C. H. Cunningham, secretary, AVMA Research Council, Department of Microbiology and Public Health, College of Veterinary Medicine, Michigan State University, East Lansing, Mich.

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Trasentine®-Phenobarbital

Vioform® (iodochlorhydroxyquin CIBA)

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COMING MEETINGS

Virginia Veterinary Medical Association. Annual meeting. John Marshall Hotel, Richmond, Feb. 2-4, 1958. Carl E. Boyd, 1308 E. Franklyn St., Richmond, program chairman.

Missouri Veterinary Medical Association. Hotel Continental, Kansas City, Mo., Feb. 9-10, 1958. W. L. Schondelmeyer, 116 E. Maple, Independence, Mo., chairman.

Wisconsin Veterinary Medical Association. Forty-second annual meeting. Hotel Pfister, Milwaukee, Wis., Feb. 10-12, 1958. Burr A. Beach, Veterinary Science Bldg., University of Wisconsin, Madison 6, Wis., secretary.

New Jersey Veterinary Medical Association. Seventy-fourth annual meeting. Hotel Berkeley-Carteret Hotel, Asbury Park, N. J., Feb. 12-13, 1958. John R. McCoy, Rutgers University, New Brunswick, N. J., secretary.

American Veterinary Radiology Society, Regular meeting. LaSalle Hotel, Chicago, Feb. 16, 1958, at 1:00 p.m. J. J. Fishler, secretary-treasurer.

Region Four American Animal Hospital Association. Winter meeting. Veterinary Clinic, Fort Collins, Colo., Feb. 16, 1958. D. T. Albrecht, secretary.

West Virginia Veterinary Medical Association. Annual meeting. Greenbrier Hotel, White Sulphur Springs, W. Va., Feb. 16-17, 1958. Gordon F. Phillips, 15 Virginia St., East, Charleston, W. Va.

Colorado State University. Nineteenth annual veterinary conference. Glover Veterinary Hospital, College of Veterinary Medicine, Colorado State University, Fort Collins, Colo., Feb. 17-19, 1958, Lloyd C. Moss, head Department of Medicine, Colorado State University, secretary.

Illinois State Veterinary Medical Association. Annual convention. LaSalle Hotel, Chicago, Feb. 17-19, 1958. C. B. Hostetler, 1385 Whitcomb Ave., Des Plaines, Ill., executive-secretary.

Indiana Veterinary Medical Association. Symposium on therapeutic nutrition. Marion, Ind., Feb. 21, 1958. J. M. Carter, 3421 S. Main St., Elkhart, Ind., chairman.

Nevada Veterinary Medical Association. Annual meeting. Hotel Holiday, Reno, Feb. 28 to March 1, 1958. J. B. Key, Tonopah, secretary.

Alabama Veterinary Medical Association. Annual meeting. Hotel Stafford, Tuscaloosa, March 16-18, 1958. McKenzie Heath, School of Veterinary Medicine, Alabama Polytechnic Institute, Auburn, secretary.

Washington, State College of. Annual Conference of Veterinarians. Pullman, Wash. April 7-9, 1958. W. R. Leader, program chairman.

American Animal Hospital Association. Silver anniversary meeting. Drake Hotel, Chicago, Ill., April 25-26, 1958. Dr. Wayne H. Riser, secretary.

Oklahoma State University. Oklahoma conference for Veterinarians. College of Veterinary Medicine, Oklahoma State University, Stillwater, May 5-6, 1958. Lester Johnson, Department of Veterinary Medicine and Surgery, chairman.

Michigan Veterinary Medical Association. Annual meeting. Grand Hotel, Mackinaw Island, June 2-4, 1958. Charles Coy, Hillsdale, general chairman.

Texas A. & M. College. Eleventh annual Texas conference for veterinarians. School of Veterinary Medicine, Texas A. & M. College, College Station, June 5-6, 1958, R. D. Turk, chairman.

North Carolina State Veterinary Medical Association. Fifty-seventh annual meeting. The Washington Duke Hotel, Durham, June 24-26, 1958. C. J. Lange, 3741 Hi-Point Rd., Greenboro, secretary-treasurer.

Canadian Veterinary Medical Association. Annual meeting. Royal Alexander Hotel, Winnipeg, Manitoba, July 21-23, 1958. Claude Kealey, 1195 Wellington St., Ottawa, Ont., executive secretary.

New York State Veterinary Medical Society. Sixty-seventh annual meeting. Concord Hotel, Kiamesha Lake, N. Y.,

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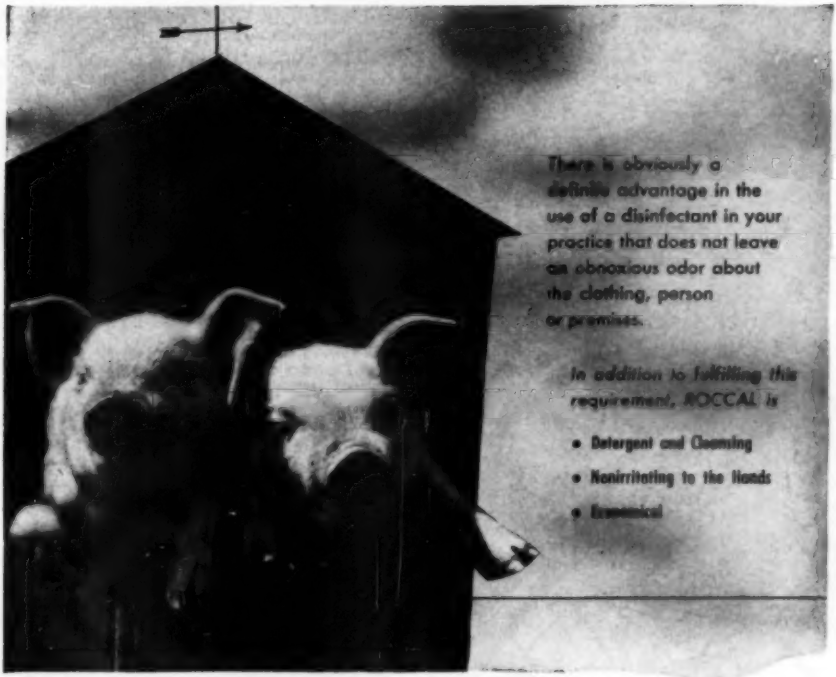
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Sept. 10-12, 1958. Joan S. Halat, 803 Varick St., Utica, N. Y., executive secretary.

New England Veterinary Medical Association. Annual meeting. Hotel Wentworth, Portsmouth, N. H., Sept. 21-24, 1958. C. Lawrence Blakely, 100 Longwood Ave., Boston 15, Mass., secretary-treasurer.

Foreign Meetings

Sixth International Congresses on Tropical Medicine and Malaria. Lisbon, Portugal, Sept. 5-13, 1958. Professor Manuel R. Pinto, Institute of Tropical Medicine, Lisbon, secretary-general. (Membership application forms may be obtained by U.S. veterinarians by writing to the AVMA.)

Regularly Scheduled Meetings

ALABAMA—Central Alabama Veterinary Association, the first Thursday of each month. B. M. Lauderdale, Montgomery, secretary.

Jefferson County Veterinary Medical Association, the second Thursday of each month. S. A. Price, 213 N. 15th St., Birmingham, secretary.

Mobile-Baldwin Veterinary Medical Association, the third Tuesday of each month. W. David Gross, 771 Holcombe Ave., Mobile, Ala., secretary.

North Alabama Veterinary Medical Association, the second Thursday of November, January, March, May, July, and September, in Decatur, Ala. Ray A. Ashwander, Decatur, Ala., secretary.

ARIZONA—Central Arizona Veterinary Medical Association, the second Tuesday of each month. Keith T. Maddy, Phoenix, Ariz., secretary.

Southern Arizona Veterinary Medical Association, the third Wednesday of each month at 7:30 p.m. E. T. Anderson, Rt. 2 Box 697, Tucson, Ariz., secretary.

CALIFORNIA—Alameda-Contra Costa Veterinary Medical Association, the fourth Wednesday of Jan., March, May, June, Aug., Oct., and Nov. Leo Goldston, 3793 Broadway, Oakland 11, Calif., secretary.

Bay Counties Veterinary Medical Association, the second Tuesday of February, April, July, September, and December at 3004 16th St., San Francisco, Calif. Mr. Herb Warren, executive secretary.

Central California Veterinary Medical Association, the fourth Tuesday of each month. R. B. Barsaleau, 2333 E. Mineral King, Visalia, Calif., secretary.

Kern County Veterinary Medical Association, the first Thursday evening of each month. A. L. Irwin, 301 Taft Highway, Bakersfield, Calif., secretary.

Mid-Coast Veterinary Medical Association, the first Thursday of every even month. W. H. Rockey, P. O. Box 121, San Luis Obispo, Calif., secretary.

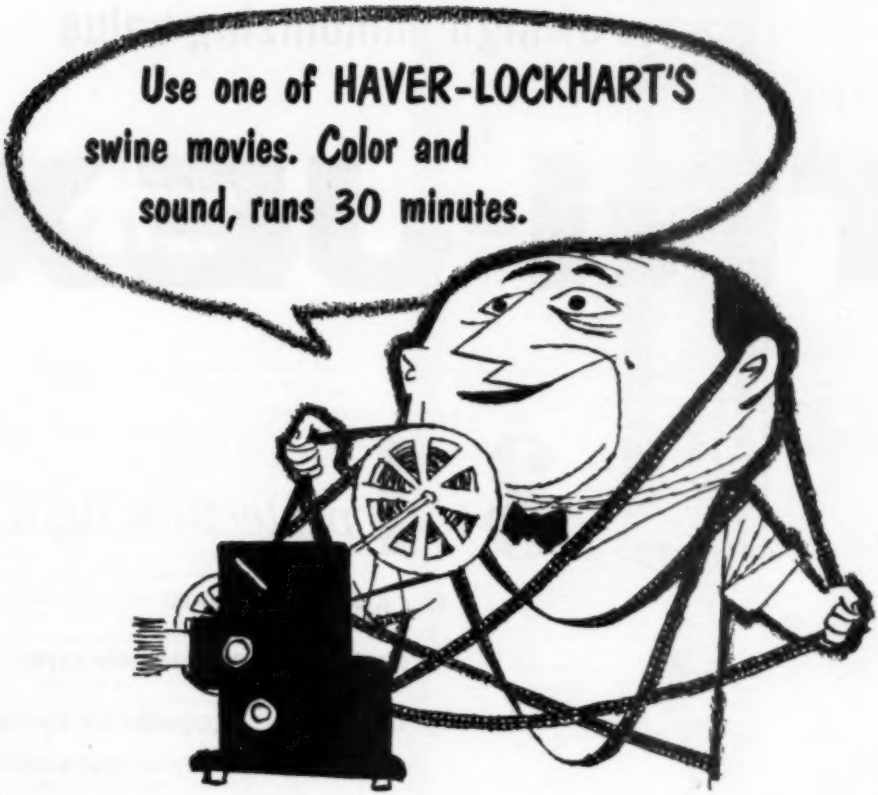
Monterey Bay Area Veterinary Medical Association, the third Wednesday of each month. Lewis J. Campbell, 90 Corral de Tierra, Salinas, Calif., secretary.

North San Joaquin Valley Veterinary Medical Association, the fourth Wednesday of each month at the Hotel Covell, in Modesto, Calif. Lyle A. Baker, Turlock, Calif., secretary.

Orange Belt Veterinary Medical Association, the second Monday of each month. Chester A. Maeda, 766 E. Highland Ave., San Bernardino, Calif., secretary.

Orange County Veterinary Medical Association, the third Thursday of each month, Donald E. Lind, 2643 N. Main St., Santa Ana, Calif., secretary.

Peninsula Veterinary Medical Association, the third Monday of each month. R. C. Lawson, 40-40 El Camino, Palo Alto, Calif., secretary.



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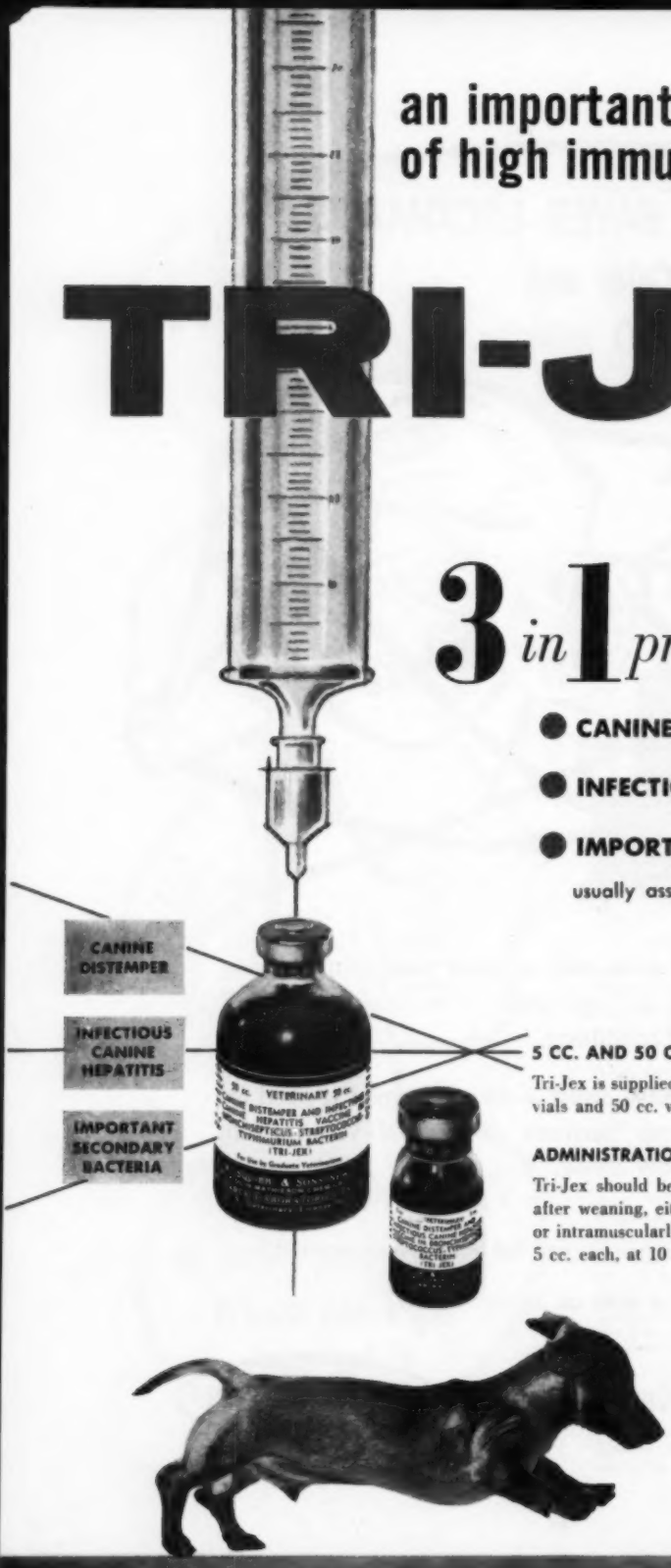
usually associated with these virus diseases.



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Redwood Empire Veterinary Medical Association, the third Thursday of each month. Robert E. Clark, Napa, Calif., secretary.

Sacramento Valley Veterinary Medical Association, the second Wednesday of each month. W. E. Steinmetz, 4227 Freeport Blvd., Sacramento, Calif., secretary.

San Diego County Veterinary Medical Association, the fourth Tuesday of each month. H. R. Rossoll, 1795 Moore St., San Diego, Calif., secretary.

San Fernando Valley Veterinary Medical Association, the second Friday of each month at the Casa Escobar Restaurant in Studio City. John Chudacoff, 7912 Sepulveda Blvd., Van Nuys, secretary.

Santa Clara Valley Veterinary Association, the fourth Tuesday of each month. Kay Beulley, N. Fourth and Gish Rd., San Jose, Calif., secretary.

Southern California Veterinary Medical Association, the last Wednesday of each month. Don Mahan, 1919 Wilshire Blvd., Los Angeles 57, Calif., executive secretary.

Tulare County Veterinarians, the second Thursday of each month. R. B. Barsalesu, 2333 E. Mineral King, Visalia, Calif., secretary.

COLORADO—Denver Area Veterinary Society, the fourth Tuesday of every month. Richard C. Tolley, 5060 S. Broadway St., Englewood, Colo., secretary.

Northern Colorado Veterinary Medical Society, the first Monday of each month. M. A. Hammarlund, School of Veterinary Medicine, Colorado A. & M. College, Fort Collins, Colo., secretary.

DELAWARE—New Castle County Veterinary Association, the first Tuesday of each month at 9:00 p.m. in the Hotel Rodney, Wilmington, Del. E. J. Hathaway, Clifton Park Manor, Apt. 73-5, Wilmington 2, Del., secretary.

FLORIDA—Central Florida Veterinary Medical Association, the first Tuesday of each month, time and place specified monthly. Jack H. McElyer, 5925 Edgewater Drive, Orlando, Fla., secretary.

Florida West Coast Veterinary Medical Association, the second Wednesday of each month at the Lighthouse Inn, in St. Petersburg. R. L. Brutus, 336 E. 15th St., Hialeah, Fla., secretary.

Jacksonville Veterinary Medical Association, the first Thursday of every month. Dodsons Restaurant. P. S. Roy, 4443 Atlantic Blvd., Jacksonville, Fla., secretary.

Northwest Florida Veterinary Medical Society, third Wednesday of each month, time and place specified monthly. T. R. Geci, 108B Catherine Ave., Pensacola, Fla., secretary.

Palm Beach Veterinary Society, the last Thursday of each month in the county office building at 810 Datura St., West Palm Beach. J. J. McCarthy, 500-25th Street, West Palm Beach, Fla., secretary.

Ridge Veterinary Medical Association, the fourth Thursday of each month in Bartow, Fla. Paul J. Myers, Winter Haven, Fla., secretary.

South Florida Veterinary Society, the third Wednesday of each month. Time and place specified monthly. Frank Mueller, Jr., 4148 E. 8th Ave., Hialeah, Fla., secretary.

Suwannee Valley Veterinary Association, the fourth Tuesday of each month, Hotel Thomas, Gainesville. W. B. Martin, Jr., 3002 N. W. 6th St., Gainesville, Fla., secretary.

Volusia County Veterinary Medical Association, the fourth Thursday of each month. A. E. Hixon, 131 Mary St., Daytona Beach, Fla., secretary.

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REFERENCES: 1. Mosier, J. E.: Vet. M. 50:603 (Nov.) 1955.
2. Belle®, O. B.: Calif. Vet. 9:27 (Sept.-Oct.) 1956.
3. Pollock, S.: J. Am. Vet. M. Ass. 129:274 (Sept.) 1956.

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What Is Your Diagnosis?

A case history and radiograph depicting a diagnostic problem appear below.

Make your diagnosis from the picture below — then turn the page ▶

Figure 1

History.—A male German Shepherd dog, 7 months old, was in normal health but had a slow growing, nonsensitive, hard mass 5 cm. in diameter on the left side of the neck. It seemed to arise from the lateral process of the fifth or sixth cervical vertebrae and had been noticeable for at least three months. A lateral radiograph of the neck was taken (fig. 1).

(Diagnosis and findings are reported on the next page)

Here Is the Diagnosis

(*Continued from preceding page*)

Diagnosis.—Multilocular calcified cysts comparable to epidermal inclusion cysts (calcinosis circumscripta).

Comment.—On physical examination, a lesion of this type immediately suggests

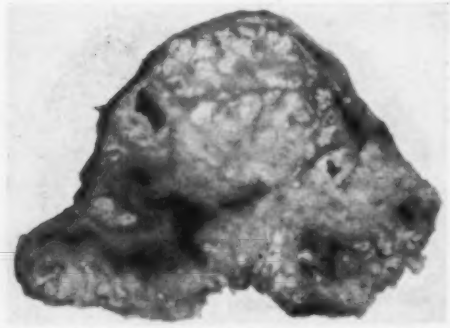

Fig. 2—Sagittal section of the mass removed from the neck. See radiograph (fig. 1).

several diagnostic possibilities, such as a foreign body, tumor, or fungous disease. Since the dog was raised in the desert area of the Southwest, coccidioidomycosis was considered. However, when the mass was surgically removed and cut transversely, it was identified as an epidermal inclusion cyst or a circumscribed calcinosis (fig. 2).

Such epidermal inclusion cysts may be found in any part of the skin and subcutaneous tissue of dogs, regardless of the age or sex. The cysts may occur solitarily, but they are usually in clusters and measure up to a centimeter in diameter. The

Fig. 3—Sagittal section of a foot showing clusters of epidermal inclusion cysts.

cyst wall is thin and tough; the contents are solid, occasionally gritty, and are white, tan, gray, or brown.

These lesions have been described[1] as wrinkled, anuclear, acidophilic squames [arranged] singly or in laminated masses. Also admixed are flat squamous cells with condensed, rod-shaped nuclei. Pieces of broken hair shafts or masses of partly disintegrated, melanin-laden epithelial cells are also included. Small clumps of calcium salts may be deposited. The lining of the cyst is stratified squamous epithelium, often flattened, and possessing clearly defined granular and germinal layers. The epithelium may be thickened, hypercornified . . . The cells of the bottom row of the epithelium may contain melanin granules or may be increased in number and produce processes extending into the surrounding stroma. Sometimes associated with this epithelial proliferation are transitions into focal areas, in which are noted the formation of abortive hair follicle structures, either solid or cystic.

When the epithelium of the cyst is intact, the wall is a compressed collagenous connective tissue of varying thickness and often partly hyalinized. This connective tissue may be infiltrated by lymphocytes, plasma cells, and histiocytes. When the . . . epithelium has been partly or completely destroyed by compression atrophy [produced] by excessive accumulation of content, foamy or melanin-laden macrophages and multinucleated giant cells surround the sloughed squames and hair shaft fragments. Slitted spaces, probably pockets of cholesterol crystals, encircled by multinucleated giant cells may also be seen. Similar foreign body reaction may extend into the stroma beyond the limits of the original cyst.

When the cyst becomes infected, the epithelium is destroyed to varying degree, so that masses of segmented neutrophils accumulate in the center. Masses of proliferated fibroblasts and capillaries mixed with segmented neutrophils, lymphocytes, plasma cells, monocytes, and hemosiderin macrophages are found in the periphery. This granulation tissue merges with a wall of new fibrous connective tissue infiltrated by chronic inflammatory cells. The overlying skin may be normal, compressed and atrophic, thickened and hyperplastic, or destroyed by ulceration. Some cysts may communicate with the surface of the epidermis by small stomas.

Since these cysts are usually benign, simple excision and control of infection are ordinarily curative.

Most of these epidermal inclusion cysts originate

[1]Mulligan, R.: Neoplasms of the Dog (1949:54). Williams & Wilkins, Philadelphia.

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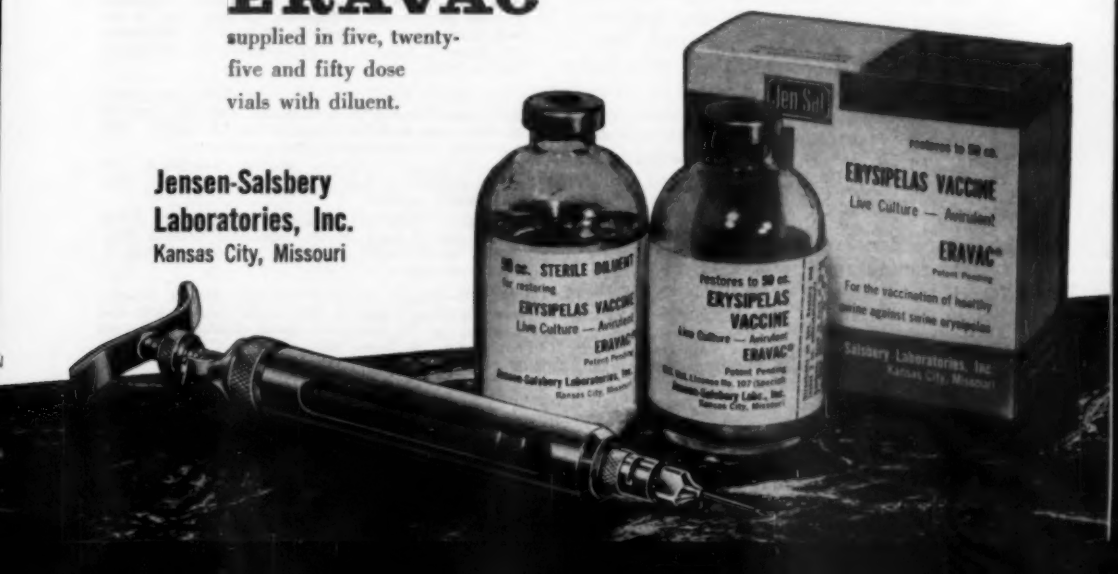

day of every month at the Elks Home on Peachtree St., Atlanta, Ga. J. L. Christopher, Smyrna, Ga., secretary.

ILLINOIS—Chicago Veterinary Medical Association, the second Tuesday of each month. Mark E. Davenport, Jr., 215 S. Edgewood Ave., LaGrange, Ill., secretary.

Eastern Illinois Veterinary Medical Association, the first Thursday of March, June, September, and December. A one-day clinic is held in May. H. S. Bryan, College of Veterinary Medicine, University of Illinois, Urbana, secretary.

INDIANA—Central Indiana Veterinary Medical Association, the second Wednesday of each month. Peter Johnson, Jr., 4410 N. Keystone Ave., Indianapolis 5, secretary.

Michiana Veterinary Medical Association, the second Thursday of every month except July and December, at the Hotel LaSalle, South Bend, Ind. J. M. Carter, 3421 S. Main St., Elkhart, Ind., secretary.

Tenth District Veterinary Medical Association, the third Thursday of each month. J. S. Baker, P. O. Box 52, Pendleton, Ind., secretary.

IOWA—Cedar Valley Veterinary Medical Association, the second Monday of each month, except January, July, August, and October in Black's Tea Room, Waterloo, Iowa. A. J. Cotten, Grundy Center, secretary.

Here Is the Diagnosis—Continued

from hair follicles, either formerly normal and then obstructed, or pinched off during embryonic development in the form of cell rests of abortive structures like hair follicles. Puncture wounds, by which fragments of actively growing epidermis are imbedded deeply in the subcutaneous tissues, may cause these cysts.

In some of these lesions there is an absence of epithelial elements and the spherical masses of calcium salts are surrounded by heavy layers of fibrous tissue. This lesion is then called calcinosis circumscripta instead of epidermal inclusion cysts.[2]

Comment (Dr. Loren D. Kintner, University of Missouri).—The above is an interesting case. To publish with it I would like to submit a photograph of a sagittal section of a foot (fig. 3) from another dog. It is from a male hound, 4 years old, with lesions in all feet. When the dog died from uremia, the feet were submitted for a diagnosis. Microscopically, they were identical with those described above.

The first case report (fig. 1, 2) was submitted by Dr. W. P. Blake, Phoenix, Ariz. The second (fig. 3) was submitted by Dr. J. A. McKitterick, Mexico, Mo.

Our readers are invited to submit histories, radiographs, and diagnoses of interesting cases which are suitable for publication.

[2]Smith, H. A., and Jones, T. C.: Veterinary Pathology (1957:640-645). Lea & Febiger, Philadelphia.

Central Iowa Veterinary Medical Association, the third Monday of each month, except June, July, and August, at 6:30 p.m., Breeze House, Ankeny, Iowa. John Herrick, Ames, secretary.

Coon Valley Veterinary Medical Association, the second Wednesday of each month, September through May, at 7:30 p.m., Cobblestone Inn, Storm Lake, Iowa. Robert McCutcheon, Holstein, secretary.

East Central Iowa Association, the second Thursday of each month at 6:30 p.m., usually in Cedar Rapids, Iowa. Dr. J. G. Irwin, Iowa City, secretary.

Fayette County Veterinary Medical Association, the third Thursday of each month at 6:30 p.m. in West Union, Iowa. H. J. Morgan, West Union, secretary.

Lakes Veterinary Association, the first Tuesday of each month, September through May, at 6:30 p.m., at the Gardson Hotel, Estherville, Iowa. Barry Barnes, Milford, secretary.

North Central Iowa Veterinary Medical Association, the third Thursday of April, at the Warden Hotel, Fort Dodge, Iowa. H. Engelbrecht, P. O. Box 797, Fort Dodge, secretary.

Northeast Iowa-Southern Minnesota Veterinary Association, the first Tuesday of February, May, August, and November at the Wisneslick Hotel, Decorah, Iowa, 6:30 p.m. Donald E. Moore, Box 178, Decorah, Iowa, secretary.

Northwest Iowa Veterinary Medical Association, the second Tuesday of February, May, September, and December, at the Community Bldg., Sheldon. W. Ver Meer, Hull, secretary.

Southeastern Iowa Veterinary Association, the first Tuesday of each month at Mt. Pleasant, Iowa. Warren Kilpatrick, Mediapolis, secretary.

Southwestern Iowa Veterinary Medical Association, the first Tuesday of April and October, Hotel Chieftain, Council Bluffs, Iowa. J. P. Stream, Creston, secretary.

Upper Iowa Veterinary Medical Association, the third Tuesday of each month at 7:00 p.m., at All Vets Center, Clear Lake, Iowa. Richard Baum, Osage, secretary.

KANSAS—Kansas City Veterinary Medical Association and Kansas City Small Animal Hospital Association, the third Tuesday of each month. Robert E. Guilfoil, 18 N. 2nd St., Kansas City 18, Kansas, secretary.

KENTUCKY—Central Kentucky Veterinary Medical Association, the first Wednesday of each month. L. S. Shirrell, Varsailles Rd., Frankfotd, secretary.

Jefferson County Veterinary Society of Kentucky, Inc., the first Wednesday evening of each month in Louisville or within a radius of 50 miles. W. E. Bewley, P.O. Box "H," Crestwood, secretary.

MARYLAND—Baltimore City Veterinary Medical Association, the second Thursday of each month, September through May (except December), at 9:00 p.m. at the Park Plaza Hotel, Charles and Madison St., Baltimore, Md. Harry L. Schultz, Jr., 9011 Harford Rd., Baltimore, Md., secretary.

MICHIGAN—Mid-State Veterinary Medical Association, the fourth Thursday of each month with the exception of November and December. Robert E. Kader, 5034 Armstrong Rd., Lansing 17, Mich., secretary.

Saginaw Valley Veterinary Medical Association, the last Wednesday of each month. S. Correll, Rt. 1, Midland, Mich., secretary.

Southeastern Veterinary Medical Association, the fourth Wednesday of every month, September through May. Gilbert Meyer, 14003 E. Seven Mile Rd., Detroit 5, Mich., secretary.

MISSOURI—Greater St. Louis Veterinary Medical Association, the first Friday of each month (except July and August), at the Coronado Hotel, Lindell Blvd. and Spring Ave., St. Louis, Mo., at 8 p.m. Chester R. Pleggе, 4249 Peck St., St. Louis 7, Mo., secretary.

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NEW JERSEY—Central New Jersey Veterinary Medical Association, the second Thursday of November, January, March, and May at Old Hights Inn, Hightstown, N. J. David C. Tudor, Cranbury, N. J., secretary.

Metropolitan New Jersey Veterinary Medical Association, the third Wednesday evening of each month from October through April at the Academy of Medicine, 91 Lincoln Park South, Newark, N. J. Myron S. Arlein, 2172 Milburn Ave., Maplewood, N. J., secretary.

Northern New Jersey Veterinary Association, the fourth Tuesday of each month at the Casa Mana in Teaneck. James R. Tanzola, Upper Saddle River, secretary.

Northwest Jersey Veterinary Society, the third Wednesday of every odd month. G. R. Muller, 43 Church St., Lambertville, N. J., secretary.

Southern New Jersey Veterinary Medical Association, the fourth Tuesday of each month at the Collingswood Veterinary Hospital, Collingswood. R. M. Sauer, secretary.

NEW YORK—New York City, Inc., Veterinary Medical Association of, the first Wednesday of each month at the New York Academy of Sciences, 2 East 63rd St., New York City. C. E. DeCamp, 43 West 61st St., New York 23, N. Y., secretary.

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Monroe County Veterinary Medical Association, the first Thursday of even-numbered months except August. Irwin Bircher, 50 University Ave., Rochester, N. Y., secretary.

NORTH CAROLINA—Central Carolina Veterinary Medical Association, the second Wednesday of each month at 7:00 p.m. in the O'Henry Hotel, Greensboro. Joseph A. Lombardo, 411 Woodlawn Ave., Greensboro, secretary.

Eastern North Carolina Veterinary Medical Association, the first Friday of each month, time and place specified monthly, Byron H. Brow, Box 453, Goldsboro, N. Car., secretary.

Piedmont Veterinary Medical Association, the last Friday of each month. John G. Martin, Boone, N. Car., secretary.

Twin Carolinas Veterinary Medical Association, the third Thursday of each month in the Orange Bowl Restaurant, Rockingham, N. Car., at 7:30 p.m. James R. Burgess, Rockingham, N. Car., secretary.

Western North Carolina Veterinary Medical Association, the second Thursday of every other month at 7:00 p.m., in the George Vanderbilt Hotel, Ashville, N. Car. Vilu Lind, 346 State St., Marion, N. Car., secretary.

OHIO—Cincinnati Veterinary Medical Association, the third Tuesday of every month at Shuller's Wigwam, 6210 Hamilton Ave., at North Bend Road. G. C. Lewis, Cincinnati, Ohio, secretary-treasurer.

Columbus Academy of Veterinary Medicine, every month, September through May. E. M. Simonson, Columbus, Ohio, secretary-treasurer.

Cuyahoga County Veterinary Medical Association, the first Wednesday in September, October, December, February, March, April, and May, at 9:00 p.m. at the Carter Hotel, Cleveland, Ohio. F. A. Coy, Cleveland, Ohio, secretary.

Dayton Veterinary Medical Association, the third Tuesday of every month. O. W. Fallang, Dayton, secretary.

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Mahoning County Veterinary Medical Association, the third Tuesday of each month, at 9:00 p. m., Youngstown Maennerchor Club, Youngstown, Ohio. Sam Segall, 2935 Glenwood Ave., Youngstown, secretary.

Miami Valley Veterinary Medical Association, the first Wednesday of December, March, June, and September. J. M. Westfall, Greenville, Ohio, secretary-treasurer.

North Central Ohio Veterinary Medical Association, the last Wednesday of each month except during the summer. R. W. McClung, Tiffin, Ohio, secretary-treasurer.

Northwestern Ohio Veterinary Medical Association, the last Wednesday of March and July. C. S. Alvanos, Toledo, Ohio, secretary-treasurer.

Stark County Veterinary Medical Association, the second Tuesday of every month, at McBrides Emerald Lounge, Canton, Ohio. M. L. Willen, 4423 Tuscarawas St., Canton, Ohio, secretary.

Summit County Veterinary Medical Association, the last Tuesday of every month (except June, July, and August), at the Mayflower Hotel, Akron, Ohio. M. L. Scott, Akron, Ohio, secretary-treasurer.

Tri-County Veterinary Medical Association, the fourth Wednesday of January, May, and September. Mrs. R. Slusher, Mason, Ohio, secretary-treasurer.

OKLAHOMA—Oklahoma County Veterinary Medical Association, the second Wednesday of every month, 7:30 p.m., Patrick's Foods Cafe, 1016 N.W. 23rd St., Oklahoma City. Forest H. Stockton, 2716 S.W. 29th St., Oklahoma City, Okla., secretary.

Tulsa Veterinary Medical Association, the third Thursday of each month in Directors' Parlor of the Brookside State Bank, Tulsa, Okla. Don L. Hohmann, 538 S. Madison St., Tulsa, Okla., secretary.

OREGON—Portland Veterinary Medical Association, the second Tuesday of each month, at 7:30 p.m., Ireland's Restaurant, Lloyds', 718 N.E. 12th Ave., Portland. Donald L. Moyer, 8415 S.E. McLoughlin Blvd., Portland 2, Ore., secretary.

Willamette Veterinarian Medical Association, the third Tuesday of each month, except July and August, at the Marion Hotel, Salem. Marvin M. Corff, McMinnville, Ore., secretary

PENNSYLVANIA—Lehigh Valley Veterinary Medical Association, the first Tuesday of each month. Stewart Rockwell, 10th and Chestnut Sts., Emmaus, Pa., secretary.

Keystone Veterinary Medical Association, the fourth Wednesday of each month at the University of Pennsylvania School of Veterinary Medicine, 39th and Woodland Ave., Philadelphia 4, Pa. Raymond C. Snyder, 39th and Woodland Ave., Philadelphia 4, Pa., secretary.

SOUTH CAROLINA—Piedmont Veterinary Medical Association, the third Wednesday of each month at the Fairforest Hotel, Union, S. Car. Worth Lanier, York, S. Car., secretary.

TEXAS—Coastal Bend Veterinary Association, the second Wednesday of each month. J. Marvin Prewitt, 4141 Lexington Blvd., Corpus Christi, Texas, secretary.

VIRGINIA—Central Virginia Veterinarians' Association, the third Thursday of each month at the William Byrd Hotel in Richmond at 8:00 p.m. M. R. Levy, 312 W. Cary Ct., Richmond 20, Va., secretary.

Northern Virginia Veterinary Conference, the second Tuesday of each month. Francis E. Mullen, 1130 S. Main St., Harrisonburg, Va., secretary-treasurer.

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Report of the Committee on Diseases of Dairy Cattle, R. C. Klussendorf, Chairman, J.A.V.M.A. *107*:355 (Nov.) 1945.

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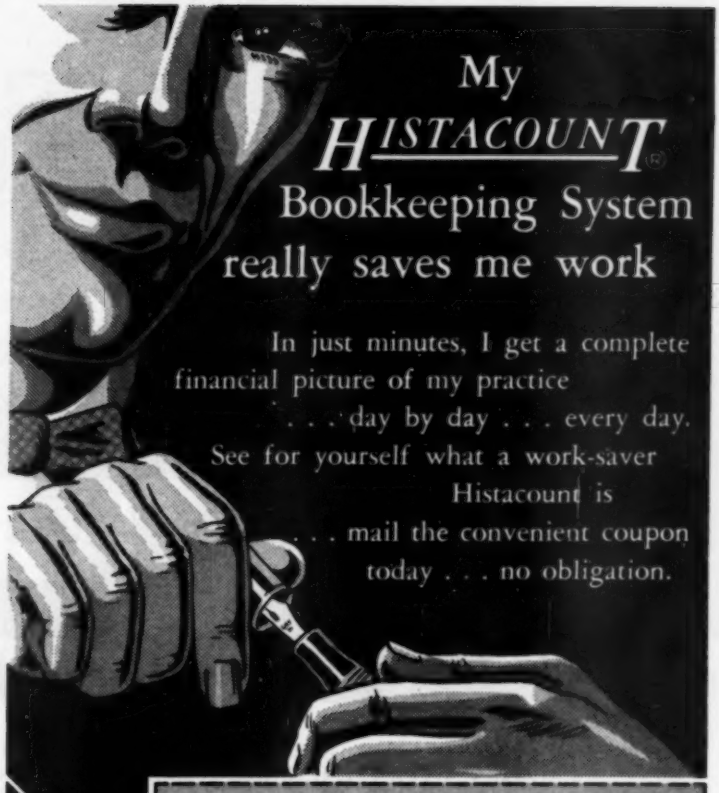
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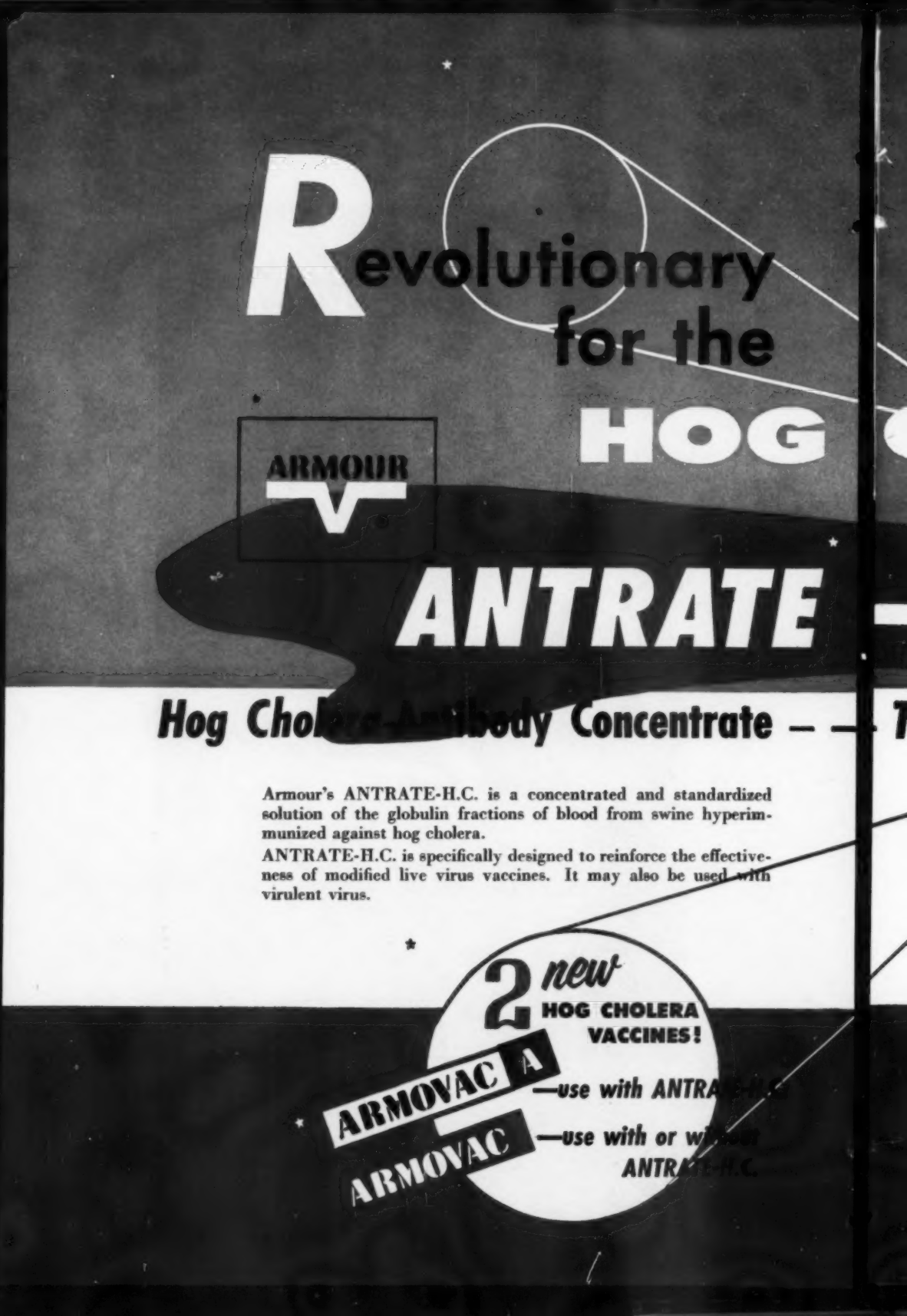
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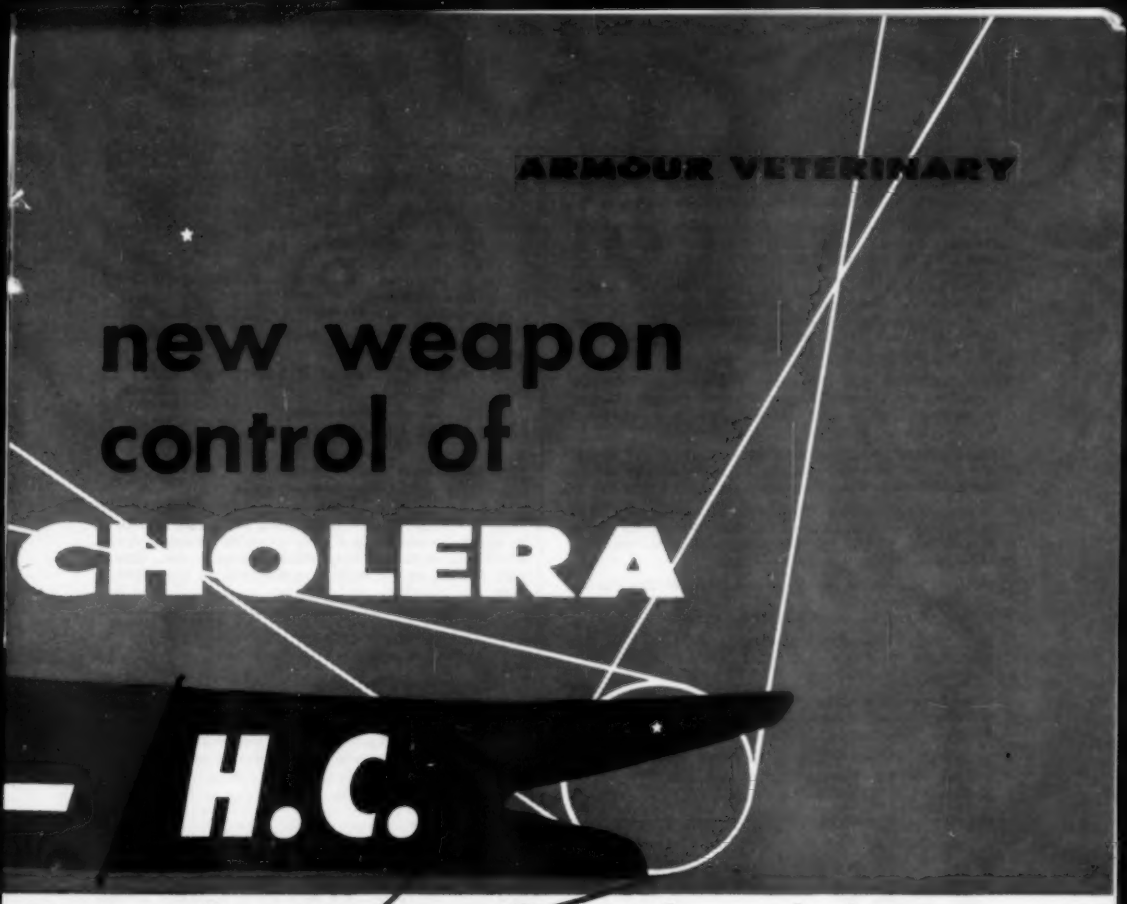

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WISCONSIN—Central Wisconsin Veterinary Medical Association, the second Tuesday of each quarter (March, June, Sept., Dec.). R. J. O'Hern, P.O. Box 617, Cumberland, Wis., secretary.

Dane County Veterinary Medical Association, the second Thursday of each month. Dr. E. P. Pope, 409 Farley Ave., Madison, Wis., secretary.

Milwaukee Veterinary Medical Association, the third Tuesday of each month, at the Half-Way House, Blue Mound Rd. Dr. R. H. Steinkraus, 7701 N. 59th St., Milwaukee, Wis., secretary.

Northeastern Wisconsin Veterinary Medical Association, the third Wednesday in April. William Madson, 218 E. Washington St., Appleton, Wis., secretary.

Rock Valley Veterinary Medical Association, the first Wednesday of each month. W. E. Lyle, P. O. Box 107, Deerfield, Wis., secretary.

Southeastern Veterinary Medical Association, the third Thursday of each month. John R. Curtis, 419 Cook St., Portage, Wis., secretary.

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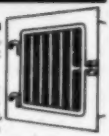

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Recent graduate, 26, service completed, desires position with commercial company. Address "Box B 10," c/o JOURNAL of the AVMA.

1954 graduate with experience in progressive small animal practice methods desires association with established practitioner. Leaving service in August. Address "Box B 18," c/o JOURNAL of the AVMA.

Wanted—Practices

OSU graduate, 1947, 33, wishes to purchase active small animal or good mixed practice; 50% or more small animal, located in city not less than 50,000-70,000. Well experienced in both phases. Ohio, Indiana, Illinois licenses. Consider any good location or partnership. Dr. Fred Metzger, 635 W. Waveland Ave., Chicago 13, Ill.

Want to lease or buy mixed practice with two-man potential near large city. Prefer property including small animal hospital. Address "Box B 17," c/o JOURNAL of the AVMA.

For Sale or Lease—Practices

Lucrative general practice in North Carolina for sale. Rapidly growing area. Includes hospital and home. Address "Box A 10," c/o JOURNAL of the AVMA.

Mixed practice for sale in New York State, including home, hospital with x ray, large stock of drugs and equipment. Price of $30,000 includes everything. Address "Box B 1," c/o JOURNAL of the AVMA.

New, 7-room, ranch-style home. Hospital with apartment on next lot. Hospital has waiting-room, surgery, x ray, equipment, 29 kennels, two-way radio. 50% small and 50% large animal. Eastern Pennsylvania. Price $32,000. Address "Box B 4," c/o JOURNAL of the AVMA.

For immediate sale—modern small animal hospital and residence on Long Island. Some capital and rapid action required. Address "Box B 6," c/o JOURNAL of the AVMA.

Established small animal practice for sale in eastern New York State. Includes real estate. Address "Box B 11," c/o JOURNAL of the AVMA.

Lucrative, fast-moving, long-established practice, drawing from three counties. 85% large, 15% small. Macadam roads, good clientele, no competition. Top grazing area U.S. Excellent home-office combination. Washer, drier, electric stove, refrigerator, dish-washer. Mild climate; ¾ acre plot. You can earn money the day you take over. Some terms to responsible individual. Address "Box B 12," c/o JOURNAL of the AVMA.

Wisconsin dairy practice for sale at price of real estate and inventory; 1½-year gross will equal selling price. Reason for selling: interested in small animal partnership. Address "Box B 13," c/o JOURNAL of the AVMA.

(Classified ads continued on adv. p. 52)

Modern, equipped, air-conditioned small animal hospital for sale or lease. Northeastern Los Angeles county; 15 miles to L.A.—Hollywood. Best possible location. Parking. $42,500. Terms. Address "Box B 21," c/o JOURNAL of the AVMA.

Well-established mixed practice for sale in Pacific Northwest town of 15,000. Modern hospital with large four-bedroom apartment above. Address "Box B 20," c/o JOURNAL of the AVMA.

Miscellaneous

Wanted to buy—used H & D emasculator, Shickles vaccinating outfit with 40 cc. syringe, and other instruments in good repair. Address "Box B 7," c/o JOURNAL of the AVMA.

For sale—Shanks portable large animal operating table, fully hydraulic. Excellent condition, has had little use. $600. Dr. Robert V. Tuma, Phillips, Wis.

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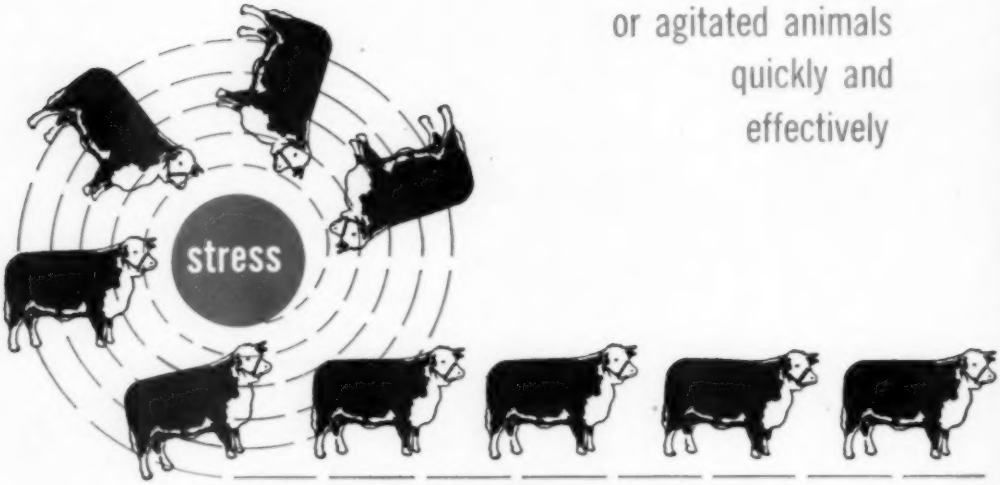

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